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INJURIES OF THE PANCREAS.

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A girl 6 years old while playing in the street was hit by an automobile and thrown down. One of the wheels struck her left hypochondrium and lumbar region. Her left elbow and face were also bruised. When she was brought to the German Hospital the next day she looked rather sick. She complained of a good deal of pain in her abdomen.

Examination showed the following: A few slight bruises about forehead. Thorax, nothing abnormal.

The abdomen is markedly distended, especially in the region of the epigastrium. less so in its lower part. Abdominal muscles are rigid, especially in the epigastrium. The abdomen is tender all over, but by careful examination it is found that the greatest point of tenderness lies towards the left and a little above the umbilicus. There is some dullness in the dependent parts of the abdomen, which disappears on changing the position of the patient. On the left side, between the lower border of the ribs and the anterior superior spine there is found a bloody discoloration of the skin. Except this bruise and a similar slight bruise of the elbow there are no signs of external injury.

Pulse 132, respiration 40, temperature 99.6°.

Urine shows a faint trace of albumin and a few hyaline casts. No blood either microscopically or macroscopically. Bowels have not moved since the accident. The patient vomited once some yellow clear fluid.

Blood examination shows 27,000 leucocytes, 89% polynuclears and 11% lymphocytes.

Diagnosis: Probably internal hemorrhage that has stopped, but inasmuch as an injury of the intestines cannot be excluded with certainty a laparotomy seems advisable.

Operation about 24 hours after injury. Incision in median line above and below umbilicus about 7 inches long. On opening the abdomen a considerable quantity of a dark bloody fluid escaped. Liver and spleen not injured. Stomach very much distended with gas, but otherwise normal. No intestinal injury. The greater omentum, however, showed a multitude of small yellowish-white spots of fat-necrosis, scattered here and there. Omentum with transverse colon and stomach were turned upward in order to expose the pancreas. At the duodeno-jejunal angle there were found a few coils of small intestine adherent to one another and covered with fibrin. The retroperitoneal fatty tissue in the neighborhood of the pancreas showed also quite an extensive fat-necrosis. After the pancreas was fully exposed by tearing through the layers of the transverse mesocolon, it was noted that the tail of the pancreas was crushed. It was infiltrated with dark blood and softened. The middle of the body of the pancreas lying in front of the vertebral column also showed fat-necrosis, but no hemorrhage. The head of the gland was found uninjured. The abdominal cavity was carefully washed out with a large amount of saline solution. A tampon was then carefully adjusted around the injured portion of the pancreas and led out through the abdominal incision and the latter was partly closed.

After the operation the condition of the little patient was rather poor. She vomited a small amount of dark brown fluid and was very restless. The day following the operation her condition began to improve a little. However, she again vomited some greenish fluid. From the third day on her condition improved steadily. During the first few days there was quite a large amount of drainage of a bloody serous fluid mingled with some pus. After removal of the tampon on the fourth day the discharge diminished rapidly and perceptibly. No pancreatic fistula developed. From this time she made an uneventful recovery.

Injuries of the pancreas with or without any complicating injuries of the neighboring organs are extremely rare. In the Pathological Institute of Leipzig there was found among 9,500 autopsies in 7½ years only 1 rupture of the pancreas. From a perusal of the literature I was able to collect only 40 cases of injuries of the pancreas without involvement of other organs. Although traumata of the abdomen either by blunt force or by bullet wounds and stab wounds are not infrequent, the pancreas is comparatively rarely involved, and, if injured, usually other organs of the abdominal cavity suffer also. This is readily explained by the well-protected situation of the gland, at a point furthest away from the anterior abdominal wall, and by its being almost completely covered by the stomach, liver, spleen and transverse colon.

Borchhardt thought it altogether impossible that the pancreas alone could be injured by bullet or knife. Koerte, however, showed by experiments on the cadaver that the pancreas can be wounded, if a gastroptosis or a coloptosis is present. In such a case the organ is covered in certain places only by the abdominal wall, omentum and the pos-

terior leaf of the peritoneum. Anomalous positions of the pancreas can also lead to injuries of the organ. These facts, ascertained experimentally by Koerte, are sustained by reports of Fowelin and Becker. The former described a case of a young woman who stabbed herself with a long and narrow knife into the epigastrium 2-3 cm. below the ensiform cartilage, near the left border of the ribs. There was a small hole in the omentum and a stab wound of the pancreas. No other organ was injured. In Beck's case a girl 26 years old shot herself accidentally with a revolver, the bullet entering between the 8th and 9th costal cartilages a little mesially from the axillary line. There was found a bloody infiltration of the serosa of the stomach towards the left, a hole in the gastro-splenic ligament and a bullet wound of the tail of the pancreas. Both cases came to operation a few hours after the accident and both recovered. These are the only cases of injury of the pancreas by a bullet or knife that are reported.

Injuries of the pancreas by blunt force have occurred more frequently. Their causes are numerous: a blow or a kick against the upper part of the abdomen, a contusion by falling against the edge of a table (Mayo-Robson), burying under masses of earth, crushing between two cars and accidents with vehicles. Cowen describes a peculiar accident where a man struck upon the water with his abdomen and thus injured his pancreas. Very often the force of the striking object has not been very great; on other occasions, this force has been so severe that it seems miraculous that other organs escape injury.

The explanation of the mechanism of injuries by blunt force is not difficult. The organs which overlie the pancreas, especially the stomach, are quite movable and are pushed out of the way by the striking object. The pancreas, however, is firmly anchored, especially its head and the body, therefore it is easily caught between the impinging object and the spinal column.

The injuries of the organ thus inflicted show either a complete tear of the gland or a bruising and crushing of different degrees, depending upon the striking force. The edges of the tear may be clean cut, as though made by a knife, or they may be irregular and ragged.

The pathological conditions found at operation show a fairly uniform picture which varies only according to the time which has elapsed since the injury and according to the part of the gland involved. Injuries of the head and the body are more serious than those of the tail, for the duct of Wirsung may be opened or may be completely torn across. In injuries of the head the common bile duct may also be lacerated as in the case of Gulecke. In such a case if the lesser omentum and the gastrocolic ligament are torn, the pancreatic secretions have access to the general peritoneal cavity acting injuriously upon the tissues. If this has happened, usually widespread fat-necrosis is seen over the upper part of the abdomen, in the greater and lesser omentum, the mesentery and the retro-peritoneal fatty tissue. This necrosis may be so intense and widely disseminated that the patient succumbs to this alone, in spite of operation and free drainage. If the patient withstands the first onslaught of this fat necrosis with its succeeding toxemia, he may still die from a sepsis following the development of retroperitoneal abscesses.

The recognition of this fat necrosis is of great importance. It is always present if some time—12-24 hours—has elapsed after the injury. If the patient comes to operation immediately, this valuable symptom may be missing. Where no other reasons are found, explaining the presence of the hemorrhagic fluid seen in all these cases, it becomes imperative to inspect the pancreas, for, if the peritoneum is not guarded against the influence of the pancreatic ferments, the patient will be lost. The hemorrhage itself is usually not marked, unless a large vessel in the neighborhood has been injured. In Walther's case there was a rupture of the coronary artery and Villiere found a tear of the splenic vein and artery. Wounds of the head of the pancreas bleed more profusely, but also here the bleeding is never alarming.

There is reported in all cases more or less hemorrhagic fluid in the free abdominal cavity. In other cases the bleeding had taken place in the omental bursa. When the foramen of Winslow was closed congenitally or the hemorrhage was slow and the opening became obstructed by inflammatory conditions, a large hemorrhagic pseudo-cyst developed behind the stomach. These pseudo-cysts may point towards the lesser omentum, or towards the gastro-colic ligament, or they may push their way between the two layers of the transverse mesocolon. This latter condition is rare. On tearing through these structures a large cavity filled with blood will be opened, at the bottom of which the injured gland lies. Such conditions are usually found in patients in whom the injury of the gland was not very severe and who came to operation some time after the accident. These cases are dis-

tinguished from the former by their milder clinical course and their more favorable prognosis.

The diagnosis of an injury of the pancreas is extremely difficult. In the majority of the cases it was made only upon the operating table,

The symptoms are those of a peritonitis which may have been caused by an injury of almost any organ in the upper part of the abdomen. There is pain in the epigastrium and rigidity of the abdominal muscles, especially in the upper quadrant. Sometimes the point of greatest tenderness is referred to the left side and a little above the umbilicus, as in our case, where injury was confined to the tail of the gland.

There is usually loss of consciousness with some vomiting of bloody fluid immediately after the accident. After recuperating from the initial shock there is not infrequently an interval free from pain and distress, so that the patients are able to reach their homes unassisted. Some were able to walk long distances. In a few hours, however, the pain recurs more severely than before. Vomiting starts in again and may become incessant. The patient now presents the picture of one dangerously ill. This free interval was pointed out by Koerte and Garré as a possible means of differential diagnosis, but it may also be found in rupture of the gall-bladder and of the stomach. Gerschuni thought that the localized distention of the upper quadrant of the abdomen, with a relative flatness of its lower portions, might help to distinguish injuries of the pancreas from injuries of other organs. I have observed this symptom also in my own case and in a case of acute hemorrhagic pancreatitis which was operated upon not long ago by me.

One condition only makes a diagnosis fairly certain, viz.: the presence of a cystic mass in the upper part of the abdomen—a pseudo-cyst of the pancreas—which can be recognized without great difficulty by its relations to the surrounding structures. This symptom, taken in consideration with the history of a trauma in the region of the pancreas helps to establish the diagnosis, as in the cases of Blecher, Heinecke and Thoele.

The temperature and the pulse are in the beginning very little disturbed. Even after a day or two we may find a normal pulse and a temperature around 99° or 100° F. The leucocyte count is, however, high. In my case the white blood cells reached 27,000 with 89% of polynuclear leucocytes. Where the injury has been a severe one with liberation of large quantities of pancreatic ferments, the peritoneal infection will spread rapidly, causing a rise in the pulse and temperature.

The urinary analysis may furnish some information of value, if sugar is found. In a good many instances, however, sugar does not appear. The Cammidge reaction can be of no value in the severe cases, as there is no time to be lost, and procrastination in operating may mean the certain death of the individual.

There are no pathognomonic features of injuries of the pancreas that would enable the surgeon to arrive at a positive diagnosis. In the majority of cases the diagnosis has been intra-abdominal hemorrhage or wounding of the stomach or intestines. We know that contusions of the abdomen without any injury of the internal organs can give the same clinical picture as a rupture of a hollow viscus or an internal hemorrhage. It is, therefore, incumbent upon the careful to exclude the possibility of dangerous injury by means of an early exploratory laparotomy. He who waits for clinical symptoms—i.e., unmistakable signs of general peritonitis—will come too late in a good many cases.

The treatment, therefore, is speedy operation. Garré was the first to save a patient by laparotomy. In his case the gland was completely torn across. He therefore sutured the covered ends by careful silk sutures—3 posteriorly; 3-4 anteriorly—only taking in the fibrous capsule. This author also calls attention to the possibility of a subsequent gangrene of the severed piece of the pancreas and considers the necessity of extirpation. The pancreas is supplied with blood by the sup. and inf. pancreatico-duodenal arteries, and the pancreatic branches of the splenic artery. As long as the splenic artery has not been torn, the blood supply of the tail of the gland is not seriously interfered with. If, however, the splenic artery has been injured and must be tied, the separated piece of the gland had better be excised. In cases in which the pancreas is crushed and bruised, the simplest and best method is the careful adjustment of a tampon around the wounded part, in order to establish free exit for the pancreatic secretions.

The pancreas is best reached either by tearing through the lesser omentum and entering the lesser sac of the peritoneum or by making one's way through the layers of the gastro-colic ligament. In my case I found the gland readily accessible in all its parts by turning the stomach, omentum and transverse colon upward. In most of the cases the tampon has been let out through the partially closed

incision. Hadra recommends not to drain through the peritoneal cavity, but to close the hole in the gastro-colic ligament, to make a counter incision in the back, drain through here, and close the abdominal incision. The first method, however, has given good results and can be effected more quickly. The hemorrhage from the gland is of small consequence and is always controlled by the tampon, which thus serves a double purpose. If the gland is sutured drainage should also always be used.

A good deal of attention has been given to the treatment of pancreatic fistulae, which in some of the cases have developed. They are especially prone to occur if the injury has been severe and has resulted in either a complete tear or in extensive crushing through which the ducts have been opened. Here the secretion of pancreatic ferments has been very abundant, 200 — 900 cc. have been noted to escape in 24 hours. The ferments have a great digestive power and cause a very extensive and annoying eczema of the skin around the abdominal incision. Wohlgemuth advocated a strict antidiabetic diet, a method of treatment which has given very gratifying results in a number of cases.

The prognosis of injuries of the pancreas is always grave. Patients who have not been operated upon have all died with symptoms of peritonitis. Less serious are those injuries in which after some time a true cyst or a pseudocyst has developed. In cases which are operated on in the first 24 hours, the prognosis is much better.

I have collected 41 cases, including my own. Among them are 37 in which the result is known. Five were not operated upon and died. Of 31 that came to operation 21 were cured and 10 died shortly after the operation, about 60% operative recoveries. Therefore, the earlier the operation the better is the prognosis.

CASUISTIC BIBLIOGRAPHY.

[1] WILKES AND MOXON: Cited by Leith, *Lancet*, September, 1895. Male. Run over. Complete transverse tear in front of vertebral column. No operation. Death.

[2] JAUN: ibid. Male, 50. Kick. Vertical rupture through the pancreas (right half). No operation. Death after 18 hours.

[3] WAGSTAFF: *Lancet*, February, 1895. Male. Fall against wagon wheel. Whole pancreas rushed. No operation. Death after four days.

[4] MIKULICZ: Stern, *Vierteljahrsschrift. f. gericht. Med.*, 1899. Male, 37. Crushed between two railroad cars. Scar through whole thickness of gland, 2cm. from end of tail. Operation after three weeks. Evacuation of hematoma Death five months later from pneumonia and pleurisy.

[5] KOLACZECK: ibid. Male, 37. Run over. Complete rupture through left third of gland. No operation. Death after eight days.

[6] SIMMONDS: *Deutsch. Med. Wochenschrift*, 1902. Male, 51. Run over. Complete tear in the middle between head and tail. No operation. Death after four and one-half days.

[7] V. SCHNEIDER: Ref. *Ctrlbl. f. Chir.*, 1904, page 1470. Male, 18. Struck by wagon pole. Transverse tear in head of pancreas. Tampon after 64 hours. Death five days after operation.

[8] VILLIERE: *Bull. Soc. Anat. de Paris*, 1895. Male, 20. Struck by wheel of a machine. Complete tear of the pancreas in its middle. Rupture of splenic artery and vein. Laparotomy without result. Death one day after operation.

[9] GARRÉ: *Beitr z. klin. Chir.* Vol. 46. Male, 24. Crushed between cars. Complete tear in middle. Suture of gland. Tampon after four and one-half hours. Cure.

[10] RANDALL: *Lancet*, February, 1905. Man. Struck by wagon pole. Rupture two inches long in body of pancreas through its whole thickness. Suture with silk. Tampon. Cure.

[11] WALTHER: *Congr. Assoc. Franc. Chirurg*, 1905. Man. Run over. Tail of gland crushed, rupture of coronary artery of stomach. Tampon. Cure.

[12] BLECHER: 35. *Deutsch. Chir. Congress*, 1906. Male, 23. Kicked by horse. Transverse rupture in front of vertebral column half through thickness of gland. Tampon five days post-trauma. Cure.

[13] THŒLE: *Deutsch. Zeitschrft. f. Chir.* Vol. 84. Man. Kicked by horse. Body of pancreas crushed. Tampon two days post-trauma. Cure.

[14] KAREWSKI: *Berl. klin. Wochensch.*, 1907, No. 7. Male, 15. Struck by wagon pole. Oblique tear in body of pancreas. Tampon five and one-half hours post-trauma. Cure.

[15] HOHMEYER: *Muench. Med. Wochenschr.*, 1907, No. 41. Female, 35. Struck by wagon pole. Complete transverse tear. Suture with catgut. Tampon one and one-half hours post-trauma. Cure.

[16] DE SANTOS: *Polytechnia*. Lissabon, 1906. Male, 32. Thrown against pillar. Partial rupture of body in front of vertebral column. Tampon 52 hours post-trauma. Death three days post-operation.

[17] COWEN: *Brit. Med. Journ.*, May, 1907. Struck upon the water with abdomen. Pancreas was not visible at operation. Tampon four days post-trauma. Cure with fistula.

[18] HEINECKE: *Arch. f. klin. Chir.*, 1907. Vol. 84. Male, 34. Landslide. Complete tear in middle of gland. Suture with catgut four hours post-trauma. Tampon. Cure.

[19] HEINECKE: *Arch. f. klin. Chir.*, 1907. Vol. 84. Male, 36. Run over. Complete tear in middle. Operation 36 hours post-trauma. Death two days post-operation.

The foregoing cases are collected by Heinecke. To this list I am able to add the following cases:

[20] DREIFUSS: *Deutsch. Zeitsch. f. Chir.* Vol. 93, page 432. Male, 19. Struck by wagon pole. Rupture of gastro-colic lig. Left part of pancreas crushed. Tampon 42 hours post-trauma. Cure.

[21] PIQUAND: *Bull. et mem. de la Soc. d'Anatom. de Paris*, 1907. Page 588. Male, 32. Tear through head. Suture. Death 30 hours post-operation.

[22] FOWELIN: *Arch. f. klin. Chir.*, 1911. Vol. 95. Female, 24½. Stab wound in epigastrium. Operation one and three-quarter hours post-trauma. Stab wound of pancreas. Bleeding stopped by suture. Tampon. Cure.

[23] BECKER: *Ctrbl. f. Chir.*, 1905. No. 5. Female. Bullet wound of abdomen. Hole in gastro-splenic ligament. Injury of tail of pancreas. Suture. Cure.

[24] ROSENBACH: *Arch. f. klin. Chir.* Vol. 89. Female, 47. Struck by wagon pole. Operation three days post-trauma. Drainage, evacuation of a hemorrhagic cyst. Cure.

[25] MAYO-ROBSON: *The Pancreas: Its Surgery and Pathology*, 1907. Specimen from St. Bartholomew's Hospital Museum. It was removed from a man who had been crushed between two vans. No operation. Death three days post-trauma.

[26] MAYO-ROBSON: Ibid. Male. Fall against edge of table, bruising of pancreas with acute hemorrhagic pancreatitis. Operation. Drainage. Death.

[27] BRAUN: *Ctrlbl. f. Chir.*, 1904. Page 938. Boy. Kicked by a horse. Operation 14 days post-trauma. Tampon. Cure.
[28] GERSCHUNI: Ref. *Ctrlbl. f. Chir.*, 1908. Page 1377. Female, 43. Struck with piece of wood. Operation 24 hours post-trauma. Tear in pancreas. Tampon. Death nine days post-operation.
[29] GULECKE: *Muench. Med. Wochenschrft*, 1910. No. 2. Man, 25. Contusion by heavily loaded wagon. Operation. Rupture in middle of pancreas, also traumatic ulcer of stomach. Death.
[30] GULECKE: Ibid. Man, 28. Struck by bull. Operation. Fat necrosis. No visible injury of pancreas. Tampon. Three months post-operation retro-peritoneal abscess. Drainage. Cure.
[31] DOBERAUER: Cit. by Gulecke.
[32] NŒTZEL: Cit. by Gulecke.
[33] HEINECKE: *Arch. f. klin. Chir.*, 1907. Vol. 84. Male. Operation 10 days post-trauma. Cure.
[34] PICQUÉ: Rep. by Guinard. Boy, 13. Thrown from bicycle. Extirpation of severed piece of pancreas. Tampon. Cure.
[35] ENDERLEN: Cit. by Dreifuss. Cure.
[36] HADRA: Cit. by Picquand.
[37] MICHAUX: Cit. by Picquand.
[38] FOUTYNON: Cit. by Picquand.
[39] AUVREY: Cit. by Picquand.
[40] GUILLEMIN: Cit. by Picquand.
[41] FISCHER: Girl, 6. Struck by automobile. Operation 24 hours after trauma. Tampon. Cure.

SPARTEINE SULPHATE A TRUE HEART TONIC, A RELIABLE DIURETIC IN TWO GRAIN DOSES.

With Especial Reference to Its Uses in Post-Operative Suppression of Urine, Pre-operative Prevention of Shock, and Pneumonia.

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Sparteine is an alkaloid derived from *cysticus scoparius*, our common broom corn. The sulphate is the only salt of this alkaloid on the market, and it is doubtless as satisfactory for general use as any that can be made. It is slightly deliquescent, but if kept in stoppered bottles it maintains its crystalline form. This salt is readily soluble in water at ordinary temperatures, and may be administered hypodermatically, by mouth or by rectum.

Much misunderstanding has existed and still exists as to the dose of sparteine. The last U.S.P. places the average dose at 1-5 gr. and a majority of therapeutic writers are in accord with that idea. Bartholow, however, many years ago gave the dose as from ½ to 2 grs., which is not in any wise excessive; 1½ to 2 grs., however, would be more nearly correct.

The makers of hypodermatic tablets have contributed in no small degree to the misunderstanding as to the dose. None of them has until recently listed a tablet larger than 1-10 gr., and few have made a tablet larger than 1-30 gr. Many practical men have tried the alkaloid in these fractional grain doses, and not being able to secure a remedial effect from the drug in such doses have thrown it aside as inert or inefficient. This has been due solely to the fact that they have not administered the remedy in quantities sufficient to establish its physiological effects in the system. Until that has been done no ground exists for the rejection of a remedy. The only rational course in an effort to test the value of any remedy is to administer it in such doses and at such intervals as to establish its full physiological effect in the system. After maintaining that effect for a reasonable time, if the therapeutic or remedial impression sought to be made has not materialized, then one has reason to doubt the efficacy of the remedy. Confirmation of this experience by repeated trial would justify its entire rejection.

Those who have used sparteine according to this rule hold it to be one of the most valuable therapeutic agents in our entire list, classing it with such remedies as calomel, quinine, strychnia, morphine, etc. Those writers who consider it of little value place the dose at 1-30 to ¼ gr. Such doses are entirely insufficient and will disappoint anyone who may depend upon them. I have made a careful study of this remedy, having used it in doses of all sizes from the fractional grain up to 3 grs., given at intervals of two hours. It was found, however, that doses of 2 grs. given at intervals of three to six hours would establish and maintain the full physiological and remedial effects of the drug in the system of an average adult. In cases where the effects of the remedy are urgently needed it is best to give 2 grs. and repeat that dose at the end of two hours, then the dose may be continued at intervals of three, four or six hours as seems indicated.

Sparteine is a true and reliable heart tonic and an excellent non-irritating diuretic, and is entirely free from untoward or objectionable effects. *It lessens the frequency and increases the force of the heart action, but does not raise blood pressue.* This is made possible by the fact that it is also a vaso-dilator, and by this phase of its action it dilates the arterial capillaries to such a degree as to enable the arterial system to receive and accommodate the increased volume of blood propelled by the more vigorous heart action without increasing arterial tension. It adds tone to the heart muscle and causes it to propel a larger volume of blood at each impulse, and by its vaso-dilator action it opens up the way for the passage of this increased volume of blood, thus increasing the propelling force and lessening resistance. This makes it the ideal heart tonic, and in my experience it is the only remedy or combina-

tion of remedies which meets this indicaton perfectly.

In the matter of correcting irregularities of heart action it should be given first place. Its effect in this respect is very prompt. Given hypodermatically the effect may be noticed in fifteen minutes, and its full effect is established within an hour. It has almost the promptness in effect of strychnia with the sustained effect of digitalis. It is also taken up readily from the stomach. The effect on the stomach itself is that of a bitter tonic. It has no tendency to cause nausea or other unpleasant symptom.

It is a reliable non-irritating diuretic. This action occurs whether the remedy be given hypodermatically, by mouth or by rectum. The general improvement it induces in the systemic circulation, especially that of the arterial capillary circulation, extending to the kidneys, would result in diuretic action, but it seems to have also an *elective action* for the kidney circulation. It has no diaphoretic action.

While sparteine is a remedy of the greatest value in all conditions requiring support and regulation of heart action, it is in pneumonia, especially, that it fills a place that no other remedy, or combination of remedies, fills equally well. In that disease we have to deal with an overworked heart and pulmonary and venous congestion, and death usually results from heart exhaustion and carbon dioxide poisoning. Sparteine counteracts the development of this condition more fully and does more to overcome it after it has developed than any other remedy with which I am familiar.

The following case will illustrate its action:

CASE I.—I. Mc F. Admitted February 8, 1900. In coming from home he traveled part of the way overland in a drenching rain and was wet and cold when admitted. He was sixty-five years old and had used gum opium by mouth for twenty-seven years. He was put to bed after a hot bath and soon seemed comfortable. That afternoon a thorough eliminating course was given and before noon the next day his intestinal canal was well emptied, and so far as could then be seen he was none the worse off for his wetting. The opiate was discontinued and the patient was kept fairly under the influence of hyoscine for the next two days, during which time calomel in small doses was given to more fully arouse his glandular system.

On the fourth day of the treatment, when it was sought to discontinue all narcotic drugs, the patient began to show signs of pneumonia, and in a short time the attack was well developed. His condition was recognized as one of extreme gravity from the beginning, because of his age and feebleness and of the long standing drug addiction, as well as because of the large area of lung involved. The temperature ran high and the other symptoms were of corresponding severity.

I had been accustomed to rely upon digitalis, strychnia and whiskey for support in such cases, and these were freely administered, but notwithstanding every effort to support him, by the fourth day from the beginning of the attack a fatal termination within twelve to twenty-four hours seemed inevitable. His pulse was 120 when reclining, but the slight exertion of rising to a sitting posture would increase the rate to 150. Respiration was 40 and labored, face livid; in fact, a carbon dioxide poisoning was rapidly developing. The writer had had some experience with sparteine before that time, but not enough to gain much confidence in it; however, as it was evident the other supportives were failing, something else must be tried. Accordingly, 2 grs. of sparteine sulphate were given hypodermatically, and this was repeated at intervals of two hours. At the time of giving the second dose distinct improvement could be seen, and within six hours the change was very marked. The pulse had come down to 90 and the volume and quality were much improved; breathing, 30 per minute and less labored. Assuming the sitting posture now only caused an increase of ten beats per minute in the pulse rate, instead of 30, as before. The digitalis and strychnia were discontinued, but no other change was made in the general plan of treatment.

Twenty-four hours from the time of beginning the sparteine the pulse rate was 70 per minute, and from that time on to the end of the attack the pulse was held at between 70 and 90, and the patient made an uninterrupted recovery. Sparteine, 2 grs. every two hours, was given hypodermatically for the first six days and then the intervals were lengthened to four and then to six hours. Its administration was kept up three weeks altogether, by the end of which time the patient had gained sufficient strength not to require support. After the administration of sparteine was begun it was depended upon entirely for control and support of circulation, and it met these indications most perfectly.

This experience led me to make very free use of sparteine and to study its action closely. During the more than ten years which have elapsed since that time, I have made almost daily use of this remedy, and I feel sure it has enabled me to meet with success many extreme conditions which I could not have met without its aid.

A case in point was that of an infant of six weeks of age in whom there was failure of closure of the foramen ovale. This little patient was under the care of Drs. Jordan and Gore, of Pine Bluff, Ark.

At birth the child appeared perfectly normal, but at six weeks of age he began to show signs of venous stasis; bowels became torpid, and as the portal engorgement increased the heart action became more embarrassed and a real "blue baby" was soon the result. Physicians were called and treatment begun. Calomel and other evacuants were given, but without favorable results. Strophanthus

and nux vomica were given in sufficient quantities to establish their physiological effects, but in spite of all treatment the patient grew worse. The heart action became more rapid, the general venous congestion more marked and the respiration more embarrassed. The writer saw the child on the third day from the time of the development of the more marked symptoms. At this time the condition of the patient seemed to be beyond hope. The pulse could not be detected at the wrist, breathing 90 per minute and the entire body was as blue as the proverbial turkey gobbler's snout. It did not seem possible for the child to live an hour longer.

This little patient was in the hands of two very competent physicians, and their treatment was in accord with the best authorities, but no improvement had been made in the condition of the patient by anything they had given. I was extended the courtesy of giving anything I wished, but there seemed nothing left for me to do but to give some soothing potion and let the little fellow die in less distress. With that idea in mind, 1-60th gr. heroin was given. At the end of half an hour, to my surprise, the baby was still alive, but more stupid. Breathing was rapid, but was attended by less effort. Not being willing to sit idly by and do nothing, but without the slightest hope of improving the child's condition, 1-10 gr. sparteine were detected. The breathing was becoming less labored, and by the end of thirty minutes more this and other signs of improvement were unmistakable. Two hours from the time of giving the first dose of sparteine, 1-20th gr. more was given. At this time the respiration had decreased to 70 per minute, and the pulse could be detected at the wrists. The deep livit hue had given way to a bright arterial flush, resembling somewhat the flush from belladonna. The child nursed and fell into a natural sleep for the first time in three days.

The improved circulation, with its attendant aeration of the blood, soon restored the nervous system to a condition of responsiveness, and then the purgatives, which had lain in the system dormant for two to three days began to act and continued to do so until the bowel was well emptied. This overcame the engorgement of the portal system, which was doubtless the exciting cause of the attack, and the child was practically well within twenty-four hours. Sparteine was continued in doses of 1-20th gr. at intervals of four hours for a week; then the time between doses was lengthened to six hours, and as a precautionary measure these doses were kept up for five months. No further disturbance of the circulation occurred and the child is now a stout, healthy boy.

Sparteine has been found very useful in post-operative suppression of urine. In discussing the paper of Dr. Montgomery, read before the North Carolina State Medical Association at Raleigh, May, 1904, I called attention to sparteine as a reliable non-irritating diuretic which could be administered hypodermatically. Dr. Stewart McGuire, of Richmond, was present and heard this discussion, and from that he began to use sparteine in such cases in 2 gr. doses. As a result he reported in the AMERICAN JOURNAL OF SURGERY, February, 1907, six cases of post-operative suppression which he feels sure he would have lost under his former management, and which were saved by the administration of sparteine. He gives the entire credit for recovery of these cases to sparteine. His experience has brought him into entire accord with my statement that the only reason this drug is not in common use is because it has been tried in doses entirely too small to be effective. He says: "To get results it must be given in doses of 1 to 2 grs., repeated every three to six hours." When so given, he says, he "has repeatedly seen it slow a runaway heart and set in motion a pair of stalled kidneys."

In surgical cases, sparteine is also of great value *in preventing shock and post-anesthetic nausea.* Its power to sustain the action of the heart during anesthesia reduces shock greatly if it does not entirely prevent it. If shock is avoided, post-anesthetic nausea rarely occurs, provided the intestinal canal has been properly emptied before the anesthetic is given. The notes of the two cases which follow are fairly typical of a series of thirty cases in which I have prepared the patient for operation, in none of which nausea followed the anesthetic.

CASE I.—J. B. G. Hip joint amputation (tubercular) operation by Dr. Crisler. The patient prepared for operation by the administration of calomel 10 grs. cascara, powd. ext. 10 grs.; ipecac 1 gr. strychnia nit. 1-5 gr., atropia sulph. 1-50th gr. made into four capsules. One each given at 4, 6, 8 and 10 p. m. on an empty stomach, followed the next morning by 2 oz. castor oil. Forty-eight hours later a course of the same strength was given, followed the next morning by oil. This was 24 hours before operation. At this time the patient was put on 2 grs. sparteine every three hours by mouth and was given liquid nourishment up to within a few hours of the time of operation. One hour before operation 2 grs. sparteine and ¼ gr. morphine and 1-100 gr. hyoscine were given hypodermatically. Patient went on operating table with pulse of 82. Ether was used and the operation lasted one and one-quarter hours. During that time there was practically no variation in the pulse rate, and at completion of operation the pulse was 88 full, strong and regular. Just before the close of the operation 2 grs. sparteine was given hypodermatically and these doses were kept up at intervals of four hours for several days. The patient was given 1 pint saline solution by rectum and put to bed. *No nausea followed and shock was not perceptible.* The patient was allowed water up to the time of operation and was given hot liquid nourishment, half a glass, three hours after operation, and this was repeated every two to three hours during the following day, then other nourishment was given.

CASE II.—Cervix and gall-bladder. Operation by Dr. Max Henning. Patient prepared for operation as in former case and was given sparteine, 2 grs., by mouth every four hours for last twenty-four hours before operation, the last dose coming one hour before time of operation, at which time ¼ gr. morphia and 1-100 gr. hyoscine were given hypodermatically. Ether was used as anesthetic. The pulse at the beginning of operation was 84; at close of operation, 90, with no perceptible change in volume. Shock was practically nil. Sparteine was continued at intervals of four hours. One pint of saline by rectum as soon as the patient was put to bed and hot water to drink was allowed three hours after operation, and from that time on was given as freely as the patient wished. Buter milk was given nine hours after operation. *The patient was not nauseated to the slightest degree at any time.*

In this series of thirty cases in which the preliminary purgation was carried out with the thoroughness above indicated and the patient kept under the influence of sparteine for 24 hours before, during and after the operation, shock has hardly been perceptible and nausea has not occurred, whereas with the same care in preparation of patient without the sparteine vomiting occurred after the anesthetic and the pulse rate was from 20 to 40 per minute more rapid at close of operation than at the beginning, and the operations were attended by the usual degree of shock.

When the intestinal canal has been thoroughly emptied and portal engorgement overcome, and the patient is well under the influence of sparteine at the time of operation, it is rare to have a variation of more than ten per minute in the pulse rate during a prolonged operation. Shock is much reduced and nausea rarely occurs. This result cannot be expected in emergency work, where there is no time for cleansing the patient's system from toxic matter, neither can it be expected in cases where a saline cathartic alone is depended upon to empty the intestinal canal, still even in these cases sparteine contributes materially to the safety and comfort of the patient.

The administration of sparteine after the operation is also beneficial. It insures a more uniform and efficient circulation, especially a better capillary circulation, and this tends to promote primary union.

In the treatment of narcotic drug addiction I have found sparteine invaluable. In the rapid or immediate withdrawal of the opiate as I practise it, *some reliable agent, one which can be depended upon for support of the heart, is essential.* Digitalis, strychnia, strophanthus, etc., are not to be compared to sparteine for meeting this crucial test.

Sparteine sulphate sells in the market at about 70 cents per ounce wholesale. Merck's, Mallingcrodt's and Squibb's preparations have been found equally reliable. For hypodermatic use, 2 grs. dissolved in 20 minims of water is a solution of suitable strength for use. This solution causes pain when injected into the tissues, but in many thousand injections I have not had an abscess from it. For stomach administration a capsule is the most satisfactory vehicle. A No. 4 capsule holds practically 2 grs., and this is a safe and efficient dose.

NITROUS OXIDE GAS AND OXYGEN ANESTHESIA.*

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The art, and it is an art, of administering anesthetics has made great progress in the last ten years. The time has gone by for the surgeon to pick up "anyone" at the last minute to give the anesthetic. Medical opinion now demands that an experienced trained person shall be procured for that purpose, and, personally, I believe that that person should be a graduate in medicine.

A large number of ingenious methods of administration for the different anesthetics has been presented to the profession, and the surgeon now is almost embarrassed in trying to make a choice from the numerous methods at his disposal. Local anesthetics are used in the spinal canal, in nerve trunks, or in and around the tissues at the site of the operation. Chloroform is used with the open mask, or, in operation on babies around the mouth, as in a cleft palate, it is used on a small gauze sponge held in a dressing forceps three or four inches away from the mouth. Or a current of air is forced through the chloroform by means of a rubber bulb and then conveyed to the patient by means of a tube held in one corner of the mouth. Ether is usually administered on a mask, but in work on the neck or mouth it may be administered through rubber tubes placed in the nasal passages, or perforated plugs that closely fit the nostrils, the rubber tubes or plugs being connected with a Y to a funnel containing gauze on which ether is poured. Ether may also be administered through the rectum, or intravenously, or by intratracheal insufflation. And then we have the nitrous oxide gas and oxygen administered by means of a mask, or through rubber plugs that closely fit the nostrils and are connected with a Y to the administration apparatus. A method has also been recently developed by

* Read before the Western Surgical Association at Kansas City, Mo., Dec. 18 and 19, 1911.

which gas and oxygen may be administered by intratracheal insufflation. These are only a few of the many methods of producing anesthesia that have been ingeniously worked out.

It is now generally conceded that all anesthetics are more or less dangerous, and the shorter the operation and the anesthesia the better it is for the patient. Before the anesthetics had been discovered, operations had to be done without anesthesia and the surgeon cultivated a dexterity that allowed the operation to be done quickly. After anesthetics had come into use, it was not considered necessary any longer to use any celerity in getting through with the operation. Everything was done leisurely because the patient was not suffering any pain and there was no need for haste. We now know that this was wrong and that every effort consistent with good work should be made to shorten the anesthesia and lessen the dose.

In the endeavor to lessen the amount of the anesthetic used, there has arisen a custom of giving a hypodermatic injection of morphine or morphine in combination with atropine, hyoscine or scopolamine, as a preliminary to the administration of the anesthetic. I have used a preliminary of morphine, 1/6 grain, and scopolamine, 1/100 grain, for several years on more than two thousand patients and have seen no bad results. It has added greatly to the comfort of the patients by quieting all apprehension, has prevented the dangers of fright, and has decidedly lessened the amount of the anesthetic required.

The three general anesthetics in general use are chloroform, ether and nitrous oxide and oxygen. Dr. J. C. Bloodgood (1) said not long ago that any changes or improvements in anesthesia should look to the safety and comfort of the patient, but that the *safety* of the patient should always be considered before his *comfort*. We should be careful that anything we do to increase the comfort of the patient does not add to his danger. I think we will all agree to these principles. Therefore, it may prove interesting and profitable to study the advantages and disadvantages of each of the three general anesthetics with this thought in view.

CHOLOROFORM.

Advantages:

1. A small amount is required to produce anesthesia and it is easy to carry around and handle. Therefore, its use appeals to the general practitioner who travels long distances in the country.
2. It is not expensive.
3. The apparatus is simple and inexpensive.
4. It is very convenient to use in obstetrical work and when given only during the pains the danger seems to be very slight.
5. It produces great relaxation of the muscles and makes the operative work easier.

Disadvantages:

1. It exerts a harmful action on the heart and the sudden deaths during administration are usually due to its depressing action on the heart.
2. On account of the comparatively small amount required, it is easy to give an overdose.
3. It exerts a harmful action on the liver, sometimes causing acute fatty degeneration of the liver and death within a few days after administration.
4. Subsequent administrations at frequent intervals are relatively a great deal more dangerous.
5. It has a sickening, sweetish odor that many patients dislike.
6. It produces a shock or depression of its own and thus contributes to the shock of the operation.
7. Its administration is frequently followed by protracted vomiting.

ETHER.

Advantages:

1. It is easier to carry around than gas, but is a little more bulky than chloroform.
2. The apparatus is simple and inexpensive.
3. It is a little more expensive than chloroform on account of the greater amount required, but not so much so as gas.
4. It relaxes all the muscles and makes the operative work easier for the surgeon.

Disadvantages:

1. It is irritating to the respiratory passages.
2. It is irritating to the kidneys.
3. It sometimes causes acute fatty degeneration of the liver cells and death.
4. Subsequent administrations frequently repeated greatly increase its harmful effects.
5. It has an irritating, pungent odor that is very disagreeable to nearly every patient.
6. It has a deleterious influence on the leucocytes which is harmful to patients with infections.
7. It produces a shock or depression of its own and thus contributes to the shock of the operation.
8. Its use is frequently followed by protracted vomiting.

NITROUS OXIDE GAS AND OXYGEN.

Advantages:

1. It has no odor and the patient is not aware,

so far as any odor is concerned, that he is taking an anesthetic. Therefore, he goes to sleep quietly and easily.

2. It produces no shock of itself and the total amount of shock from an operation is much less under gas and oxygen than under ether.

3. It does not have any harmful action on the leucocytes, therefore is indicated in infections.

4. Its danger is not increased by frequent subsequent administrations.

5. There is much less post-operative vomiting from gas and oxygen than from ether or chloroform.

Disadvantages:

1. It is considerably more expensive than ether or chloroform.

2. It does not produce the deep relaxation of the muscles that is seen under ether or chloroform.

3. The anesthesia is much lighter and more transient and consequently requires more watchfulness and expertness on the part of the anesthetist to produce an even smooth narcosis.

4. It requires a more expensive complicated apparatus for its administration, and the anesthetist, or someone in charge of the apparatus, must have mechanical ability to keep the joints gastight and keep it in smooth working order.

An analysis of the disadvantages of gas and oxygen show that they concern the surgeon and anesthetist, but not the patient. The disadvantages of gas and oxygen do not add any discomfort or danger to the *patient*. Please note that.

Ether undoubtedly has an irritating effect on the kidneys. If this statement is doubted by anyone, all he has to do is to examine the urine of a few patients for three days after an ether anesthesia and all doubt will be removed. A few years ago I did this, and the amount of granular and epithelial casts, blood cells and kidney cells in the urine, as shown by the microscope, was one of the things that made me begin the preliminary use of scopolamine and morphine in the effort to lessen the amount of ether required.

Bevan and Faville (2) in their classical article showed conclusively the harmful effect of chloroform and ether on the liver cells which caused death in some cases several days after their use.

We all know the irritating effects of ether on the respiratory system which has caused post-operative pneumonia a good many times. We have all learned the wisdom of postponing an operation temporarily if the patient has an acute bronchitis and ether is to be the anesthetic.

Ether and chloroform have odors that are very disagreeable to nearly every patient. A patient who has been given an anesthesia of ether or chloroform does not want to smell the drug for a long time after. The odor makes him sick and recalls the disagreeable features of the anesthetic.

Ask those patients, who have been given ether or chloroform, what was the most disagreeable feature that they remember connected with the operation, or what they would dread most in a future operation, and nine times out of ten they will tell you it is the anesthetic. After a gas and oxygen anesthesia, properly given, they do not dread a second anesthesia. We often administer gas and oxygen and drain an appendicular abscess or a pelvic abscess, and a few days later remove the appendix or tubes. The patient makes no protest about a second operation. We often have a patient ask for gas when a gauze drain is to be removed and we readily grant the request. At the time we were using ether we never had a request of that kind.

Gas produces no shock of itself. Crile (3) claims there is only one-fourth of the shock from the same amount of trauma under gas anesthesia that there is under ether. Take anyone in good health and anesthetize him with ether for fifteen minutes some morning and he will not be able to do anything much the remainder of the day. I have been anesthetized with gas for fifteen minutes and have been out and attending to my business an hour afterwards. Ether and chloroform undoubtedly have an after-depressing effect on the patient. This becomes a very important matter if the patient is already depressed by an infection, hemorrhage or any other cause.

Graham (4) claims that ether has a deleterious influence on the leucocytes, and therefore adds to the dangers of an infected patient. So far there has been no evidence that gas and oxygen has any such influence. Clinically, gas and oxygen is the choice of Murphy and other operators in suppurative peritonitis and other infectious diseases.

Any danger from gas is not increased by frequent administrations. Offergeld (5) and Mueller (6) pointed out several years ago that a second anesthesia of chloroform or ether following the first within two or three days carries with it about twice as much danger. This is not true of gas and oxygen. I have given it repeatedly to the same patient without any ill-effects. Will's D. Gatch (7) also claims that he has given gas repeatedly to the same patient without any ill-effects.

There is practically no discomfort due to the anesthetic following a gas and oxygen anesthesia. The patient awakens quickly within a few minutes, bright and cheerful, without any depression. Once in a while a patient will vomit once immediately after the anesthesia, but there is no protracted vomiting such as is seen, sometimes, after ether.

As to the disadvantage of gas, its cost makes it almost prohibitive for the slow operator, who requires one and one-half hours for an appendicectomy, or three hours for an ordinary hysterectomy. Gas is not the anesthetic for the operator doing "chronic surgery." The expense may be lessened by allowing the patient to rebreathe the gas and oxygen as suggested by Gatch[7]. The rebreathing does not seem to harm the patient, and it greatly lessens the amount of gas consumed. Where the gas is used in quantities sufficiently large to justify the initial expense of the plant, the cost can be still farther lessened by putting in a hospital the apparatus for its manufacture.

I have had such an apparatus installed in the St. Francis Hospital in Peoria. The gas is made and stored under pressure in a steel tank. It is admitted through a metal pipe to the operating room at an even pressure of twenty-five pounds by means of an equalizing gauge. This has been found by experience to be the best pressure for the administration of the gas, but the pressure may be varied at the equalizing gauge to suit the ideas of the anesthetist. The oxygen may be procured cheaper than it can be manufactured at the hospital. It comes in large tanks holding 1,250 gallons, and can be bought for about one-half cent a gallon. It is delivered to the operating room by an equalizing gauge at about ten pounds pressure.

I use the Teter administration apparatus. The gas and oxygen go from the mixing chamber through several coils of small pipe immersed in water, which is heated by an alcohol lamp enclosed in a miner's safety device. The miner's safety device prevents any possible ignition of ether vapor from the alcohol lamp. The warm gas then goes through a rubber tube to the inhalation mask. The Teter apparatus also has an ether container, and varying proportions of the warm gas may be passed over the ether, if desired, by a system of cocks. The boiling point of ether is so low, being about 96°, that the warm gas takes it up readily. Any proportion of oxygen may be mixed with the nitrous oxide gas in this apparatus, or any proportion of ether may be added to the mixture.

As to the second objection, that gas does not relax the muscles, the only difficulty encountered is in operations involving the recti muscles and the leg muscles in operations in the lithotomy position. In elderly women, who have borne children, the recti muscles relax well under gas and oxygen, and in old people of both sexes the leg muscles relax in the lithotomy position. All of my perineal prostatectomies are done under gas and oxygen.

If there are no conditions in the patient contraindicating the use of a small amount of ether, such as a bronchitis or a nephritis, and an operation is necessary, involving the separation of the recti muscles, or the lithotomy position, such as removal of hemorrhoids, gas is administered until the patient is asleep. Gas has no odor, so the patient has no disagreeable sensations on going to sleep to recall after the anesthesia is over. After the patient is asleep a cock is turned which switches the current of warm gas so that it passes over the ether. About two or three drams of ether are added to the mixture in this way. This produces the necessary relaxation of the muscles, and the gas is then turned off from the ether. The gas will hold the relaxation during the remainder of the anesthesia.

If there is any contraindication to the ether, any operation may be done under gas and oxygen alone, but it makes more difficulties for the operator and involves more use of retractors. The most difficult operation to do under gas and oxygen anesthesia is the removal of hemorrhoids in a young man. Hernias, appendicectomies through the McBurney incision, drainage of empyemas of the chest, drainage of appendicular and other abscesses, amputation of breasts, goiter and other neck work, operations on the extremities, in fact all operative work, except abdominal and pelvic work, where the incision is through or between the recti muscles, and operations requiring the lithotomy position, may be done just as easily under gas and oxygen as under ether. Operations coming under the two exceptions may be done readily under gas and oxygen, but not so easily as under ether.

The third objection to gas should not carry much weight. It requires more watchfulness and experience and expertness on the part of the anesthetist, it is true. The surgeon cannot pick up "anyone" to administer gas to his patient. But he should not do this, anyway. The very fact that the anesthetist who administers gas must watch his patient closely to keep him smoothly under it, makes me like the gas that much more.

It has been my experience that patients will more readily consent to operative work if "laughing gas"

is to be the anesthetic. I cannot entirely explain the psychology of this, but I have concluded that gas is associated in their minds with extraction of teeth and minor surgery. Therefore, an anesthesia of laughing gas unconsciously lessens their sense of the gravity of the operation. It is a fact that I have operated on old people, who had carried tumors and gallstones for years and steadfastly refused surgery until they heard that I was using "laughing gas." Then they consented.

To recapitulate: The patient is given scopolamine, 1-100 gr., and morphine, 1-6 gr., about one and one-half hours before the anesthesia is begun. This is a beneficient measure that adds greatly to the comfort of the patient by relieving all apprehension and fear, and in my experience it has not added anything to the dangers of the anesthesia.

The anesthesia is begun with nitrous-oxide gas and oxygen, and is continued with it to the close of the operation, unless the incision is made through or between the recti muscles or the operation requires the lithotomy position.

In patients where the incision involves the recti muscles or requires the lithotomy position, and the recti muscles or the leg muscles do not relax under the gas and oxygen, a little ether vapor (two or four drams) is added until these muscles are relaxed and then the anesthesia is continued under gas and oxygen exclusively. If one of these patients has any disease of the liver, kidneys, or lungs, including the bronchial tubes, the entire operation is done under nitrous oxide gas and oxygen exclusively, no ether being given. Giving no ether makes the work more difficult for the operator but it is safer for the patient.

If at any time during the anesthesia the anesthetist feels that the patient's heart needs the stimulating effect to ether, and there are no contraindications, he can mix ether with the gas and oxygen by switching some of the warm gas through the ether container. The apparatus is flexible, and varying proportions of gas, oxygen and ether may be used to suit the requirements of the individual patient. In this way the anesthetics are fitted to the patients; and not the patients to one anesthetic.

While many surgeons may not care to use gas and oxygen for pracically all surgical work, as a few of us are doing, the fact still remains that nitrous oxide gas and oxygen is the safest and best anesthetic for all minor surgery, for operations during surgical infections, for operations where shock is present or likely to be caused, for operations on patients who have bronchitis or nephritis, and for patients who require more than one anesthesia within a few days. Is it too much, then, to say that an apparatus for the administration of nitrous oxide gas and oxygen is one of the *requirements* of modern surgery?

Since the above paper was read I have lost two patients on the table.

In Case I adhesions were separated around the gall-bladder and duodenum resulting from a former drainage of the gall-bladder. The appendix was also removed. The operation was done entirely under nitrous-oxide gas and oxygen. As the patient was going under the anesthetic it was noticed that her heart was beating rapidly and tumultuously with an irregular irregularity. This quieted down in a few minutes. The operation was completed and I was closing the incision through the upper portion of the right rectus muscle. The incision through the skin was partly closed when respirations and pulse stopped at practically the same time. Artificial respiration, massage of the heart through the chest wall, and all the other known means of resuscitating a patient were used, but to no avail. The anesthetic was administered by my oldest anesthetist who had administered nitrous-oxide gas and oxygen to several hundred patients. An autopsy was held, but no cause for death could be found. Portions of the heart and kidney, removed for microscopical examination, showed nothing abnormal.

In Case II after a few minutes administration of gas and oxygen the patient's color was very bad. It was a ghastly green color. Ether was turned on with the Teter apparatus for a few minutes so that very little gas would be required. I had just completed the incision and noticed that the blood was a peculiar brick dust red color. The Teter apparatus was pushed aside and the operation was completed under ether administered by the open method. A stone was removed from the common duct. Just as I was closing the skin portion of the incision through the upper portion of the right rectus muscle the patient gave a little gasp and ceased to breathe. In a few seconds the heart stopped beating. Artificial respiration was performed and I hastily reopened the incision, passed my hand up to the diaphragm and massaged the heart. Although this was done for a long time I did not feel the faintest contraction of the heart at any time. The patient's color had remained the same ghastly green all through the operation. On examining the gas it was found to have a very disagreeable odor, very much like chlorine. The gas was evidently very impure. During the making nitric oxide gas

had been carried over into the receiving chamber.

In Case I the nitrous oxide gas and oxygen must be held responsible for the death of the patient. In Case II the gas and oxygen was not responsible, because it was the impurities that killed the patient. The method of anesthesia, however, must come in for some share of the responsibility. If we had been warned of the danger we would have known that the gas should have been discontinued the minute an odor was detected in it. The anesthetist who administers gas should always inhale a little before beginning the administration and promptly discard it if it has any odor. It was peculiar that in both these patients the operative work was done in the upper abdomen.

I am convinced that in abdominal work, where relaxation of the muscles is necessary to aid the surgeon, nitrous oxide-gas and oxygen is not as safe to use as in other places. Too much gas is required to produce the necessary relaxation.

[1] Progressive Medicine, December, 1910, page 188.
[2] Journal A. M. A., Sept. 2, 1905.
[3] Journal A. M. A., Dec. 2, 1911.
[4] Journal A. M. A., March 26, 1910.
[5] Arch. f. Klin.-Chir. 1905, No. LXXV, page 758.
[6] Arch. f. Klin.-Chir. 1905, No. LXXV, page 876.
[7] Journal A. M. A., March 5, 1910.

Excision of Chancres.

The case of multiple genital and extragenital chancres reported by Dr. W. S. Gottheil in the June issue of the JOURNAL, must be regarded as a most valuable contribution to the subject of multiple initial lesions, the occurrence of which is still denied or at best questioned in many quarters.

Apart, however, from the interest of this unusual case, Dr. Gottheil's paper deserves commendation because of its advocacy of excision of the initial lesion in suitable cases, and I desire to join with him in this plea as a matter of routine practise. For some years it has been my invariable custom to excise these initial lesions wherever it has been possible to do so, and the results have been more than satisfactory. If the general disease itself has not been altogether aborted by this practise, and I believe it has in some instances, it is undeniably true that early excision has the effect of diminishing the severity of the attack in a most appreciable manner. The lesion is removed together with some of the healthy tissue surrounding it, and treated like any surgical wound. As a rule, healing is rapid and uneventful.

It has been my custom likewise to excise chancroids; if properly performed, it is a simple matter to convert an ulcer, resistant to treatment, into a clean surgical wound, which responds easily to usual surgical measures. At times, when the lesion is a large one, a few sutures may be used to bring the edges of the wound together; this facilitates rapid, primary union, and leaves but a fine linear scar. The operation of excision is certainly deserving of a retrial.

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PRIMARY TUBERCULOSIS OF MESENTERIC GLANDS.*

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I find myself under the necessity of invading the domains of surgery, for primary tuberculosis of the mesenteric glands is a borderland province, whose annexation to surgery seems imminent.

Dr. Walter Stark (*Beiträge zur Klinische Chir.*, 1907) mentions the experiments of Dobroklonsky made in 1890, who by feeding pure culture of tubercle bacilli to guinea-pigs proved that bacilli may penetrate the intact intestinal wall; but we do not require this mooted observation to explain how mesenteric glands may become primarily tuberculous. For (1) Microscopic tuberculous ulcers may be the focus of absorption. (2) A trauma or erosion of the mucosa or a lymph follicle may open the channels to the lymphatic stream.

Is the assumption that the intestinal tract is the source of infection justified? Prophylactic considerations and the frequency of the disease in children make this an important question. Milk being an acknowledged purveyor of tuberculosis, certainty or even probability of its truth, make the methods of prevention obvious. The investigations of Hans Thiemann make the truth of this assumption almost incontrovertible. In his latest contribution to the subject (*Archiv. für Klinische Chir.* for 1909-1910), beautifully illustrated by cases collated and operated upon, he showed that the glands affected in 15 out of 25 cases were located to the right of the spinal column near the second lumbar vertebra, four times to the right and left and twice to the left, but quite movable, i.e., in 21 out of 25 instances the site was practically identical. He furthermore points out that anatomical conditions predestine the goal of infection. The lymphatics of the ileum near its junction with the cecum, and of the latter, form a system to a great extent separate from that of the remaining intestinal tract. They follow a course from right to left and upward, with the ileum and cecum as a base, emptying into the receptaculum cyli near the second lumbar vertebra, the latter forming the apex of their triangular confluence. At this apex the tuberculous tumor is generally found. This intestinal segment is the most probable tuberculous nidus. The food during its passage has two prolonged resting places: 1, the stomach; 2, the ileo-cecum. Whatever of micro-organic admixture the chyme has harbored,

*Read before the Metropolitan Medical Society, December, 1911.

awakened from its dormancy in transit from the stomach to the ileum, lights up to florid activity in its delay at the ileo-cecal valve and its sluggish progress through the cecum, the widest portion of the gut with least peristaltic efficiency. The infected appendix is a frequent victim of these conditions. Here is the site of typhoid ulcers, and hence flow in the poisoned stream of the lacteals, tubercle and other pathogenic micro-organisms, until they are halted by the mesenteric glands grouped to the right of the lower dorsal and upper lumbar vertebrae. The point of exit is the uninjured, mechanically fissured, eroded or ulcerated mucosa. It is to be remembered, however, according to E. M. Corner, that the glands tributary to the small intestines are usually the seat of tuberculous change in cases occurring in children.

It is notable how infrequent and long delayed, even though the infection is necessarily a mixed one, are suppurative inflammations. The mesenteric glands possess a remarkable inherent or acquired tolerance. They exhibit the phenomena of inflammation, caseous degeneration and calcareous infiltration for weeks, months or even years before causing abscess. According to Hermann Mächtle (*Beiträge zur Klinische Chir.*, 1907) they may originate bone, joint, organic and even miliary tuberculosis. But abscess formation may occur as illustrated in Thieman's cases (*loc. cit*) and by one under my observation.

Statistically, the most striking proof of the inadequate attention which primary tuberculosis of the mesenteric glands has received clinically, is the contrast in the number of cases detected during life and treated, and those found at necropsies. In view of the large number of instances met with post-mortem, the scant notice which the disease receives from the internist is surprising. We must look for the literature on the subject almost exclusively to surgical monographs. The standpoint of medical authors is perhaps best illustrated by Sir William Osler, who says that "slight tuberculosis of the mesenteric glands is common in children—it can often be found post-mortem, the lesion which produced them in the meantime having gotten well and disappeared." Treatment is dismissed with few words and its surgical aspect practically ignored. Whatever work has been done by American surgeons has not been considered of sufficient importance for report or tabulation. Scattered through recent literature we find occasional reference to tuberculous glands found near the appendix, discovered during operations concerned with that organ. Tuberculous mesenteric glands are, of course, found commonly associated with tuberculous peritonitis and tuberculous enteritis.

While I believe that I may have overlooked some, that private and hospital records may contain many, never published, I was able to find the following 31 cases only on record:

Age.	Male.	Female.
1-5	2	2
6-10.....	6	1
11-20.....	4	0
21-30.....	3	4
31-40.....	1	3
41-50.....	2	1

Two, ages not given.

In all of these the glands were extirpated. Of the five cases of Corner, four recovered; the fifth, a child of two years and nine months, died of acute meningitis. Of the twenty-six collected by Thiemann, four died as a direct result of the operation, i.e., 15.4 per cent., two of them children two and one-half years old, another a child, of sepsis (age not given), and a man of twenty-nine of heart failure. My own case, a woman of twenty-five, recovered with an abdominal fistula. The case is one of peculiar interest, in so far as the tuberculous glands were discovered two years before her operation, while she was under my care for another ailment. I saw her first September 30, 1907, when she gave the following history:

C. K., 23 years, married, born in New York, one of twins, mother died of chronic nephritis. Father 63, diabetic for many years. Several sisters in good health. Rheumatism at 12 (after scarlet fever), particularly in shoulders, also in wrists and ankles. Helpless in bed for several weeks. Well since. Menstruated at 12½, regular, without pain. Married five years. Has twin boys, four years old, whom she nursed partially four months. Miscarried three years ago and again a year ago—both times at two months. For a year has noticed a lump in the epigastrium, which from time to time became sensitive and painful, subsided in a week or ten days, then troubled her no more, until next recurrence. Constipated. For three weeks has not felt well. Complains of pain in epigastrium, in legs, ankles, calves, neck and elbows. Pains began in epigastrium. Has had sensations of chilliness and heat. Appetite fair. No thirst. No headache. No nausea. No jaundice. Tongue slightly coated. Heart and lungs negative. Widal negative. Urine negative. Liver not enlarged. Area of splenic dullness increased and edge palpable beneath ribs. Slightly to the left of the median line, below the spleen, was to be felt a tender mass the size of an orange, compressible and quite movable. Temperature 100° F. by rectum; pulse 92.

The right foot and ankles were puffy, the space under the outer ankle being tender and slightly reddened. On the third day fluctuation developed at this point, which was incised and a teaspoonful of pus evacuated. The right inguinal glands had become swollen and tender, but soon subsided to normal. In two weeks the abscess was healed. At the end of this time the mass in the epigastrium had also nearly disappeared, though on deep pressure disseminated nodules were palpable and tender. The patient, however, considered herself well and devoted herself to her usual occupation. Laparotomy was advised but refused. No tuberculin test made.

April 7, 1909, nearly two years later, she gave birth to another child, which she nursed for six months, and remained well until October 24, 1909. On that day she took to her bed, having for several days complained of anorexia, thirst, chilly sensations, abdominal pains localized about the umbilicus and general prostration. A mass uniformly resilient, tender, about the size of an orange, quite movable, was to be felt in the median line, between the umbilicus and ensiform cartilage. Dr. A. A. Berg, who saw her with me four days later, agreed on the necessity of operation. The blood examination showed moderate leucocytosis—15,500 with 75 per cent. polynuclears.

From Dr. Berg's report, kindly furnished to me by him, I cull the following items: A hard mass, the size of an orange, was felt near the median line, almost on top of the abdominal aorta—at the site of the mesenteric glands. Three pockets of pus were found from which, by aspiration, whitish-yellow pus was obtained.

Pathological report: Tissue—Tuberculosis with acute purulent inflammation. Culture of pus: Spread negative—no tubercle bacilli found. Cultures sterile.

After her discharge from the hospital the patient gained 30 pounds, but has a fistulous tract leading to the extirpated glands.

Primary tuberculosis of the mesenteric glands is a disease which belongs to the borderland of medicine and surgery. In the adult, even with a positive tuberculin reaction, the diagnosis can at best be tentative. The number of neighboring organs necessarily make it so. Branson's dogmatic statement that "hard, movable tumors in the belly of a child, which are not fecal are caseous mesenteric glands" may not meet uniform assent, but is the emphatic expression of a pathologist's view. He found that 22 per cent. of his autopsies, made in the study of abdominal tuberculosis, had this lesion alone. Sims Woodhead (1888) found tuberculous mesenteric glands in 78.7 per cent. of autopsies in tuberculous children; in 11 per cent. the mesenteric was the only lesion present. Colman (1893) found them in 66 per cent and Walker Carr (1894) in 54 per cent. It is difficult to explain the slight clinical recognition which in view of these figures they receive. Their importance, however, ought not to be underestimated, for, like tuberculous bronchial glands, they may at any time determine a general infection. This being granted, their extirpation would be as unequivocally indicated as that of a diseased appendix. In certain cases, however, and under certain conditions, medical treatment only may be practicable. Success depends, as in other tuberculous affections, on carrying out all its tonic dietetic, climatic and hygienic details. The end results of surgical intervention, for the initiation of which credit must be given to Corner, have in the main been satisfactory. As degenerative inflammation rarely results in abscess formation, but in caseation or calcareous infiltration, complete extirpation is generally feasible and recovery perfect.

Therefore, regarding tuberculous disease of certain mesenteric glands referred to in this paper, the following conclusions are offered:

(1) Its recognition is not as general as is warranted by the frequency of its discovery at autopsy.

(2) After months or even years of latency it may cause tuberculous disease in any part of the body.

(3) It is most frequently found in children, hence the importance of a pure milk supply.

(4) Chronic constipation is a contributory cause.

(5) Obscure abdominal pain with digestive disturbance and rapid loss of flesh are indicative of the disease.

(6) During laparotomies for disease of the appendix or intestines, the mesenteric glands should be carefully examined.

(7) As mesenteric glands rank second in the etiology of general tuberculosis, their extirpation upon discovery is imperative.

POST-OPERATIVE TYMPANITES AND SINGULTUS.

In the treatment of tympanites and hiccough, the giving of carminatives, such as peppermint, Hoffman's anodyne, turpentine, and oil of wintergreen, should never be permitted. These drugs should be relegated to the family medicine closet and never allowed to enter a serious situation of this nature. Their use is irrational and wholly futile.

Gastric lavage affords considerable relief. The hypodermic administration of physostigmin (eserin) has always seemed to me to be of benefit whenever it was used. This drug must be pushed to its physiologic limit.—S. T. POPE, in the *J. A. M. A.*

THE INDICATIONS FOR AND TECHNIC OF ABDOMINAL CESAREAN SECTION, AND ANALYSIS OF 100 CASES

Taken from the Wards of the First Division of the New York Lying-In Hospital.*

Ross McPHERSON, M.D.,
NEW YORK CITY.

The reasons for this paper are complex—they might be easily summed up under the general observation that Cesarean section has gained new importance in the past few years in the minds of obstetricians, but this renewed interest itself demands some explanation. A marked improvement in technic has greatly lowered the percentage of mortality for this operation, so that the rapid recovery and good after-condition of the patients have made this a more humane method of delivery under certain conditions than other methods in vogue.

It is scarcely necessary to review here the growth of that improvement and far less necessary to give a history of the operation itself, since it is one which in some crude form or other has existed from comparatively early times.

Its history falls somewhat easily into three groupings: (1) the earlier, crude operations before antiseptic knowledge could make of this anything but a last resort for the need of saving the child's life—this includes also the first brutal measures without even anesthesia, where the mortality was enormous; (2) recent improvements since the time of Sanger and Harris; (3) contemporary methods under aseptic surgery with improved and constantly improving technic.

This development has followed a general and known law of procedure which might be called life's law of supply and demand. Where there is a constantly appearing need there will be constantly improving adjustments to meet that need. Since then there is always with us a variable number of persons whose physical condition, momentary or general, precludes normal delivery, there must of necessity be some such adaptation of means to ends as shall insure the greatest number of successful births.

The real intention of this particular discussion is, then, the explanation of the part Cesarean section plays in meeting these demands.

As the recurring need has been so persistent in the history of surgery, we shall confine ourselves less to the "whether" of Cesarean section and more to the "when" and the "how."

There is little doubt but that its sphere of usefulness has extended and that we are disposed to employ it more and more in cases where there is not only some obstruction to labor either maternal or fetal, sufficient to endanger the life of mother or child, or both, but also when, although the possibilities of delivery through the natural passages exist, it will be accompanied with such traumatism to the mother and strain upon the child that they will both be subjected to future misfortune.

Indications.

With your permission then I shall take up the indications in general calling for an abdominal Cesarean section which are, broadly speaking, all cases where there is a degree of obstruction to delivery either on the part of the mother or the child sufficient to render such delivery impossible by the natural passages with the best results to both. It is, of course, necessary to understand that the child is viable and that the mother's general condition is such that she will survive an operation when performed by a competent surgeon.

These indications as given in an article read by me before the Obstetrical Section of the American Medical Association in June, 1908, are those which I still believe to be accurate. They are as follows:

1. Deformed pelvis.
2. Disproportionately large child.
3. Placenta previa.
4. Eclampsia with partially dilated cervix complicated or not with the other causes I have already given.
5. Neoplasms of the uterus such as fibroids, carcinomata, etc.
6. Vaginal deformities such as marked contractions from scars, etc.

Taking these up in order, I should like to add a few words of further explanation. By deformed pelvis we mean any pelvis which is so contracted or misshapen as to hinder the passage of a living child through it. These deformities may be of many sorts, justo-minor, flat, rachitic, Naegele, Roberts or osteomalacic. The main feature to be related is that there is some disproportion between the individual fetus and the individual pelvis so that the passenger may not come through alive or without extreme danger to mother or child, or to both.

We no longer do Cesarean section simply because the true conjugate measures too short, for we know that certain types of pelvis such as the Roberts type, for instance, where the true conjugate is even longer than normal, render delivery by the vaginal route impossible because of the amount of contraction at the sides.

The general shape and contour of the pelvis plays so large a part in the assurance of the value of indi-

*Read before the Detroit Academy of Medicine, March 12, 1912.

cations for Cesarean section that the necessity for ante-partum examination of the patients becomes more recognizable from year to year, and it is only by the skill with which a surgeon trains his hand in examination that he can be assured of the proportion of the pelvis to the fetus. Other indications as to the physical force of the mother with supplementary information concerning her previous deliveries will enter also into his final decision.

There remains as a corollary to this general understanding of the relation of pelvis to fetus, the additional factor of the size of the child to be born. No matter how entirely the pelvis may coincide with the normal measurements, it is obvious that should the fetus be abnormally large, the relative disproportion again exists.

All of these considerations taken together do but strengthen the necessity for careful ante-partum examination, and a number of cases treated at the Lying-In Hospital in which rupture of the uterus occurred, might easily have shown an uneventful career if the mothers had been under supervision in the latter part of their pregnancy.

There is, with little doubt, a class of cases where Cesarean section comes into competition with delivery by forceps, podalic version, accouchement forcé, or pubiotomy, when the physician is called upon to exercise the greatest judgment in making a decision, and while there should be great latitude for opinion in these matters, yet the record of cases is so large in which the mother was extensively lacerated, with a lifelong sequence of invalidism, or the child maimed, with mental or physical efforts of future suffering, that the treatment might reasonably have been expected to yield better results with the high-incision operation where these lacerations and maimings are minimized.

In an article written by myself concerning the indication for delivery in *placenta previa,* I then left the question open as to whether Cesarean section is generally advisable. My reasons at that time were that in a woman in good condition with a normal pelvis and a fetus viable, by packing, followed after a certain time by rapid version, we may obtain nearly as reliable results as with Cesarean section, and this operation was reserved for a selected class of cases. Since that time, however, I have come to believe that Cesarean section is called for in a much larger number of cases of placenta previa, being well aware that this is not generally conceded by obstetricians in this country, although much approved.

Other Causes.

The other causes in my table will more readily present their own credentials. They are mainly of such an order as might be accounted necessities. In morbidities such as carcinomata, fibro-myomata, monsters, and the like, there can in many instances be but little choice left the surgeon. Of the 100 cases under discussion, these form too small a part to enable general observations to be drawn from them.

In one case among the 100 under consideration, that of double monster, incapable of birth through the vagina, the mother made a good recovery. In a case of a large fibroid on the left side of the uterus the child was delivered in good condition, the mother dying of shock.

It will be noticed at once in this series that the main indication will be found to lie in some form of pelvic deformity. In all, 72 per cent. came under this heading with and without other complications. The deformities were of the following types:

Naegele type	3
Justo-Minor	47
Flat, simple or otherwise	15
Rachitic, plain or with complications	5
Contracted pelvis	7
Deformed from hip disease	2
Funnel shaped	1

The cases of protracted labor of from twenty-four to forty-eight hours duration were seven, in all of which the mothers recovered. There were two cases of disproportionately large children; two of atresia of vagina, and one of inability to push child through with no other complications noted beyond that of a very slightly contracted, flat pelvis. All of these cases made good recoveries for both child and mother. Placenta previa was treated by Cesarean section in eight cases. In three of these cases there were further indications of deformed pelvis—one with ruptured membranes, 24 hours of labor and a previous history of forceps and instrumental delivery. Both mother and child recovered. All of the mothers recovered in the placenta previa operative cases. It is interesting to note in view of the claims previously made as to the relations of placenta previa to endometritis that of these cases only one occurred in a primipara.

This record is very good in view of the fact that the usual mortality for placenta previa is in the best circumstances of hospital practise almost 18 per cent. for the mother and 40 per cent. for the child.

Of the group where the indications were eclampsia there were seven cases in all, three com-

plicated with a deformed pelvis—one rachitic. Of these five had partial dilatation. Two of these cases died. This is too small a number from which to deduce any percentage whatever; there are, however, sufficient indications in comparing large numbers of cases to believe that a better result may be hoped for in eclampsia from Cesarean section than from many of the other means of forced delivery.

The number of mothers who died out of this entire number was seven—a percentage of seven, which is reduced by the following factors: Pott's disease accompanied by paraplegia in one case. This was a hopeless case; the operation was performed simply to save the child's life with the knowledge that nothing could be done for the mother; pulmonary embolism three days after the operation, one case; pneumonia, one case; eclampsia in two cases, and shock following the removal of large fibroid tumor in one case. One died on the table in taking the anesthetic before the abdomen was opened. This leaves a mortality percentage from the operation itself of one to two per cent.

The Operation.

This is, in the practise of the Lying-In Hospital, usually not undertaken until the patient has had time to go into labor sufficiently to secure some dilatation of the os, thereby facilitating drainage in the puerperium and determining whether or not the head will make an attempt to engage.

The technic consists, after the usual preparations as for any laparotomy, in opening the abdomen by an incision about 12 cm. in length slightly to the right of the median line and extending from above downwards to the umbilicus. One or two gauze pads wet in warm salt solution are placed above the fundus, which will be found directly under the wound, in order to hold back the omentum and intestines. The frequent twisting of the uterus upon its long axis, especially to the right, makes it desirable to rotate the uterus to the left so that its anterior wall looks directly forward, thus bringing the uterine incision in the middle of the organ, in which location we have usually less hemorrhage. The assistant regulates his pressure on the sides of the abdominal wound so that the uterus is held well up to the abdominal opening until it is emptied of its contents—child, placenta and membranes—and until several of the deep sutures are in place and tied. No effort to control the hemorrhage is made as it has been found to be unnecessary.

The uterus is carefully opened with a scalpel in order to keep the membranes intact, and the hand should be swiftly swept around between them and the uterine wall so that later when the uterus has contracted there will be no delay in removing adherent membranes. Neglect of this precaution may often mean that the membranes must be removed piecemeal. The anterior thigh of the child is grasped and a breech extraction is done whenever possible, turning the child after delivery of the shoulders so that it faces towards the mother's face. An assistant stands ready to clamp and cut the cord. The child is taken away to another room and respiration established.

In all of this it is understood that the uterus is not delivered from the abdominal cavity. The placenta and membranes are next extracted and then we hook two fingers of the left hand into the uterus at the upper angle of the wound and with the right hand pass the deep interrupted sutures of No. 2 chromic catgut through the cut edge of the uterine wall down to the endometrium and well out on the opposite side in reversed order. These sutures are readily buried by a continuous suture of No. 2 plain gut placed so as to pass through the peritoneum, well into the muscle and folded over the first layer of stitches much in the manner of a Lembert suture, thus bringing the peritoneum into apposition. The abdominal pads are removed and the wound is closed in layers as in any ordinary celiotomy. The after-care in uncomplicated cases is that of any laparotomy, together with that of the usual post-partum case.

Multiple Cesarean Section.

There is a question as to whether there should be prevention used in cases where operative measures of such stringency as this are liable to be necessary in future pregnancies of women who have once undergone Cesarean section. This refers, of course, to the desirability of sterilizing the mothers. The record for the cases of multiple Cesarean section in this series of one hundred operations would seem to indicate that such drastic measures are not needed. In eighteen of the hundred there had been a history of previous operation by the same means and in several instances more than one such operation. All of these mothers lived except the one who died of Pott's disease.

In one case only did the child die in this series of successive Cesarean operations and death was due to hemophilia, with mother constitutionally delicate and only kept alive by out-of-door treatment.

It would seem as if the dread of future pregnancies making tragic the lives of many young mothers whose first child has been lost for some of the reasons indicated in these tables might very reasonably and happily be removed. The mortality, maternal and fetal, is in this particular table nothing.

In an interesting case coming under the observation of the Lying-In Hospital showing eventually five successive Cesarean section operations, it was not until after the fifth that operative measures for making the mother sterile were thought necessary and the reasons for final recourse to this mode of procedure was due to the fact that there were omental adhesions following the first operation and also to the condition of the uterine wall which showed irregular thin places in it. After the third Cesarean she was reported as more comfortably delivered than by ordinary methods. In this case the mother had never had a normal delivery, her first child having been taken by craniotomy and the five succeeding ones in the manner indicated. After the fifth operation she sat up on the tenth day post-partum, nursing her own baby and departed from the hospital in good health with her child on the sixteenth day.

In an article read by J. A. Harrar, of our attending staff, at the February meeting of the Obstetrical Section of the New York Academy of Medicine, upon the subject of "Uterine Scar After Cesarean Section," he gives the following record of his observations and of those of his colleagues. The uterine scar may itself be perfectly healed, making strong tissue, but it should always be cut out at each renewed Cesarean in order that there shall not be two parallel scars. For it has been ascertained that the breakdown of tissues comes, between these two scars, rather than in the scar itself, but probably to a cutting off of the blood and nerve supply. In conclusion, then, the main points which I have tried to illustrate by this series of cases are:

1. Cesarean section is the preferred method of operation when the obstruction to delivery is such that a viable foetus cannot be delivered by the normal passage and the mother seems a fit subject for operation in the hands of an experienced operator.

2. The obstruction may be that of a deformity of the bony pelvis or any one of the other obstructive causes mentioned above.

3. The fact that the patient has been some time in labor need not preclude the efficiency of the operation, although it would always be better to have it elective just before or at the beginning of labor as indicated.

4. The conditions should be satisfactory for this operation, as it requires a particular technic with skilled assistants for the best results.

5. The most important points of the technic are:
   a. High incision.
   b. The non-delivery of the uterus from the abdominal cavity.
   c. The absence of any method of constriction to prevent bleeding, as this is not necessary.
   d. The method of suture as described above.

6. Given the conditions as herein described and eliminating such patients as would die whether the Cesarean section were performed or not, we have a reasonable expectation of a maternal mortality not to exceed 2 per cent. of the cases and a stillbirth per cent. of almost nothing.

20 WEST FIFTIETH STREET.

CESAREAN SECTION FOR ALBUMINURIA.

Case Report.

FRANCIS T. B. FEST, M.D.,
LAS VEGAS, N. M.

Cesarean section is coming into its own and the unwarranted dread of this operation is disappearing. I do not report this case for any new feature or phase in diagnosis or technique, but solely for the clinical aspect justifying the interference and on account of the rapid recovery from the symptoms demanding the operation.

The patient is a married women, Spanish-semitic, aet 30, v-para. The husband underwent specific treatment for secondary lesions the fall before. She presented herself in May, suffering from pains in the abdomen, irregular bloody discharge and a skin eruption. The pains were in the lower right region, aggravated when standing, disappearing gradually when prone.

On examination we found large veins around the anus, and in the vulva and vagina; the uterus was soft and large. A soft mass, about the size of a small orange, could be distinguished in the right broad ligament. This mass could be compressed and reduced itself greatly when lying down. The youngest child was ten months old and still nursing. The complement reaction was positive. I made the tentative diagnosis of varices in the right ligament, pregnancy in the 4th to 5th month and lues. The patient lived in the country, domestic affairs demanded her presence at home, and all we could do at that time was to begin antiluetic treatment. Thereafter the woman lost flesh, began to suffer from dull headaches, pain through the body, ma-

laise, oliguria and painful micturation. Fetal movement was felt in the latter part of June.

The patient entered the hospital in September. The eruption had disappeared. The abdomen was rather small for the period of gestation. The mass in the right broad ligament had transformed itself into a ridge leading to the right side of the fundus uteri. The mucous membrane over the enlarged veins in vulva and vagina had broken down and these ulcerations caused the suffering during urination. Micturition was frequent and scanty, less than 300 cc. in twenty-four hours. Urine highly albuminous, with casts and blood. Pulse 120 and weak. The facial expression was not good, the mentality indifferent. The usual medication was undertaken, but without result. The albumin increased so that the test-tube contained a solid mass after boiling.

Dr. E. B. Shaw saw the case in consultation and we observed the patient a week longer without the slightest benefit. The child was viable at that time, yet its fate, if pregnancy were allowed to progress, was doubtful at the very best. Considering the danger of infection from the ulcerated vagina, considering the abnormal condition within the abdomen and considering the good results from Cesarean section in clean conditions, we decided on hysterotomy as the safest for the mother and perhaps the only chance for the child. Decapsulation of the kidneys would follow if the interruption of the pregnancy would not bring about the desired result.

The operation took place October 11. We made the classical incision. The ovarian veins on the right side formed a finger-thick strand of varices; the ovary itself was so absorbed by a vascular mass that only a trace of the glandular structure was remaining.

After the removal of the child a Porro operation was done and the varicose plexus excised. The *left* side was varicose in a slighter degree, but also demanded ligation of the veins. We proceeded as radically because the circulation was too disturbed to trust that the puerperal uterus would take care of itself without infection on account of the condition in the vagina.

Recovery was speedy. The woman left the table with a very improved pulse. Polyuria started within ten hours and on the third day all albumen had vanished and with its disappearance the mental condition had become normal.

The child, somewhat deformed, succumbed within an hour after the operation.

GENERAL PERITONITIS FOLLOWING SPONTANEOUS RUPTURE OF A PYOSALPINX.*

JOHN A. McGLINN, A.B., M.D.,

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PHILADELPHIA.

Bonney[1] in November, 1909, reported a case of spontaneous rupture of a pus tube into the general peritoneal cavity and reviewed the literature of the subject. In an exhaustive review he found a record of thirty-one authentic cases reported up to June 1, 1909.

From his study he drew the following conclusions:

1. Spontaneous rupture of a pyosalpinx or a tube-ovarian abscess into the general peritoneal cavity producing acute fulminating peritonitis is a very rare accident.

2. In the severity of its symptoms it usually resembles other forms of perforative peritonitis.

3. It conforms to the general rule obtaining in such cases, that the earlier the operation is performed the greater is the chance of recovery.

4. It is a very momentous accident having a mortality of 35 per cent. even in those cases in which operation is made during the first twelve hours.

5. It should be considered as the possible causative agent in all cases of acute general peritonitis of obscure origin occurring in females.

6. Its proper treatment is immediate operation.

Bovée[2] in April, 1910, reports a case and reviews the literature of the subject. He found reports of 55 cases, making, with his own, 56 to that date. He states that a more careful review might reveal a few more cases, but considers that the condition must be an extremely rare one. In his series the mortality was 58 per cent.

My experience with the condition is limited to the following case:

M. B., Russian, age 34, was admitted to St. Agnes Hospital, August 2, 1910, with a diagnosis of incomplete abortion, probably criminal. Temperature on admission 101° F. Chief complaint, pain in the lower abdomen and discharge of blood from the vagina. Bleeding began two days prior to admission to the hospital. She has had six children at term, no abortions. Family and previous medical and surgical history negative. Heart and lungs normal, pulse 80. Abdomen pendulous,

*Read before the Philadelphia Obstetrical Society.
[1] Surgery, Gynecology and Obstetrics, November, 1909.
[2] Surgery, Gynecology and Obstetrics, April, 1910.

but not distended, some tenderness in both inguinal regions. An internal examination was not made, as I happened to be out of the city when the patient was admitted.

During the early morning of the following day the patient was seized with excruciating pains in the lower abdomen and became unconscious and pulseless. In a few hours distention and rigidity of the abdomen occurred. The resident physician, being suspicious of ruptured ectopic pregnancy, refrained from stimulating the patient and she gradually recovered partly from her shock.

In my absence my colleague was asked to see the patient. He made a diagnosis of ruptured ectopic pregnancy and prepared to operate. I reached the hospital prior to the operation and Doctor Fisher kindly turned the case back to my service. In view of the symptoms I agreed fully with his diagnosis and operated. On opening the peritoneum I found the belly full of pus instead, as I expected, of blood. The right tube was ruptured at the isthmus. The left tube was full of pus, but unruptured. The appendix was normal. No adhesions were present in the abdomen, as nature had not time to make any attempt to wall off the infection. Both tubes and ovaries were removed. The pus was so widespread that the only way it could be removed was by flushing with normal saline solution. The peritoneal cavity was drained at different points with rubber tubing through stab wounds. The patient was placed in the Fowler position and the Murphy treatment started as soon as she was returned to the ward. Every effort was made to combat shock, but she died about twelve hours after operation.

The patient was in bed at the time of rupture, and no purgative had been given her, so that this case must be classed as one of spontaneous rupture.

113 SOUTH TWENTIETH STREET.

THE RÔLE OF THE FEMALE IN INFERTILITAS MATRIMONII.

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LOUISVILLE, KY.

In previous addresses, having considered in detail the relationship existing between criminal abortion and infertility in *vinculum matrimonii*, likewise the rôle played by the male in connection therewith, it would appear there remains little of interest to be said concerning the female. There are, however, a few instances in which the female alone is primarily responsible for infertility, first, from her inherent incapability of conceiving; second, where conception having occurred normal childbirth is impossible. The latter class can hardly be designated infertile, since if conception be possible the woman is not infertile; according to proper interpretation of the term, she is potentially fertile, but relatively sterile.

It must be apparent to anyone who has investigated the subject that a physically normal and healthy female who has not advanced beyond the childbearing period is not often primarily accountable for infertility, and if she remain childless it is usually due to (a) sterility or incompetency of the male, or (b) being unwilling to assume the responsibility of motherhood, she wilfully and deliberately terminates utero-gestation with or without the aid of the criminal abortionist.

The perversion of normal maternal instinct known as maieusiophobia accounts for a few childless marriages, which may be attributed principally to the erroneous ideas advanced by mothers in the education of their daughters, i.e., that while a fashionable and wealthy marriage is always a consummation devoutly to be wished, childbearing is a fearful matrimonial catastrophe, an insult to exalted womanhood, which must not for a moment be tolerated! However, the unwise attitude assumed by modern (so-called) society mothers in the education and enlightenment of their daughters concerning the marriage relation, criminal abortion, etc., has been so fully outlined in a previous address that further comment herein is unnecessary.

As already intimated, the assumption is reasonable that, contrary to the teaching of the older authors, the normal physically healthy female is but rarely primarily responsible for infertility. A woman may be infertile because of congenital or acquired abnormality or malformation of the external or internal genitalia, in which event the proper designation would appear to be "unfertile," since she is utterly incapable of either impregnation or childbirth, although possibly otherwise in normal physical health. Moreover, such genital malformation is usually so apparent upon even superficial investigation that adequate explanation of the infertility is thereby afforded, the physical and anatomical condition precluding normal coitus. The latter assertion would naturally not apply, however, where the malformation consisted merely in absence of ovaries, Fallopian tubes, or uterus, provided the external genitalia were normal in size and conformation, thus permitting copulation. As a rule, however, where the internal generative organs are deficient or absent, there is also a corresponding marked imperfection of the external genitalia.

To insure female fertility there must be: (a) healthy ovaries and the production of normal ova; (b) patulous oviducts for transportation of ova to the uterus; (c) a fairly healthy endometrium so that an impregnated ovum may find suitable soil

for implantation and development; (d) the vagina and cervix must also be sufficiently patulous to permit ascent of spermatozoa for contact and fructification of the ova.

Too much importance has hitherto been accorded cervical stenosis, endometritis, etc., in the production of female infertility in otherwise normal and healthy women, e.g., not many years ago the gynecologist thus explained the majority of childless marriages, and hundreds of unfortunate females accordingly had their uteri curetted and packed, their cervices dilated and tamponed, and other equally useless, even harmful, methods of treatment were employed, without favorable result so far as productiveness was concerned, since the infertility was primarily and essentially attributable to other causes which were not then well understood or appreciated. The narrow viewpoint of the gynecologist could not be made to include observation and investigation of one of the most important factors in the production of female infertility, viz., the male!

It is now well known that conception frequently occurs despite the presence of cervical stenosis, endometritis, cervicitis, vaginitis, leucorrhea, and even large uterine fibro-myomata. Such pathological processes in otherwise normal and healthy women ordinarily have less influence upon the production of infertility than numerous other and apparently minor causative factors upon which too little emphasis has hitherto been placed, e.g., (1) oöphoritis and consequent interference with production and extrusion of normal ova; (2) salpingitis with resulting stenosis and obstruction; (3) inflammatory ovarian adhesions which prevent or obstruct the extrusion of ova; (4) mechanical separation of ovaries and tubal fimbriæ due to bilateral prolapse, defective development, or pelvic neoplasms; (5) elongated and enlarged cervix with abnormally short vagina, likewise an exceedingly short cervix and elongated vagina, preventing entrance of the spermatozoa into the os externum; (6) certain uterine malpositions and displacements producing temporary or permanent cervical occlusion; (7) infantile, atrophic or undeveloped uterus with consequent abnormality of the endometrium; (8) an abnormally large or markedly prolapsed uterus producing acute angulation of the cervix; (9) unusual laxity of the vaginal walls, or an extremely large vagina, facilitating immediate outflow of seminal fluid, the spermatozoa, thus failing to reach the cervical opening.

Some of the foregoing are properly denominated minor factors in the production of female infertility, which, because of their very simplicity and ease of detection, are apparently not infrequently disregarded by the examining physician, yet when discovered and the proper remedy intelligently applied, impregnation promptly occurs. Others, however, should not be designated as minor features, since their detection and adequate treatment is quite impossible without abdominal incision, which is usually unjustfiable in the absence of well-marked indications therefor in addition to the infertility.

Primary and likewise secondary infection of the ovaries and Fallopian tubes with tuberculosis occurs more frequently than generally supposed, and constitutes a prominent causative factor in the production of female infertility. Too much importance, however, has been attached to the influence exerted by general tuberculosis in this connection, although it is recognized that any debilitating disease or one which impoverishes the system and depletes vital energy, may be a contributing factor. Almost without exception, however, females the subjects of general tuberculosis continue fertile until the end of the chapter unless rendered sterile from some other cause, and it is not unusual for women in the last stages of phthisis pulmonalis to conceive; indeed, the writer is aware of instances where such women have perished therefrom shortly after giving birth to apparently healthy children.

Syphilis, *per se,* contrary to prevailing opinion, seldom causes female infertility, since the disease offers no bar whatever to copulation and impregnation. Fortunately, however, only a few conceptions in syphilitic women terminate in the birth of living children, and if born alive they usually succumb at the end of a few weeks, the reasons for which are too obvious to require elaboration herein.

Anemia, chlorosis, obesity, etc., have been mentioned as causative factors in female infertility, as have also many other general diseases where the relationship, if any exist, is so remote as not to merit recognition as determining causes.

Infectious disorders of chldhood and adolescence, by inducing destructive changes in the immaturely developed generative organs, may entail ultimate infertility. Such an eventuation, however, must be rare except where as a result of the constitutional disease there occurs arrest of development or atrophy and consequent functional inactivity of the ovaries or uterus.

Local disturbances may be the cause of female infertility, since they prevent consummation of the

procreative act, e.g., in vaginismus the hypersensitiveness is sometimes so intense that the least attempt at intromission of the male organ (even touch of the finger) induces such violent contraction and muscular rigidity as to effectually close the vaginal orifice. There have been recorded several instances where vaginismus persisted for years, rendering normal coitus impossible despite all the known methods of treatment. In an extreme example at one time reported by an esteemed friend of the writer (Prof. Cartledge), the woman was anesthetized and while thus insensible was impregnated by her husband, later giving birth to a normal healthy child, but the vaginismus persisted throughout the entire course of utero-gestation, even preventing customary digital examination at the beginning of labor to determine the presenting part of the fetus. Pruritus vulvæ and vulvar eczema may also induce vaginismus and thus prevent normal coitus, and under such circumstances as a matter of course the woman remains infertile since normal sexual intercourse is impossible.

An hypertrophied, unyielding, muscular hymen is sometimes the cause of infertility, in that complete intromission of the male organ is thereby prevented, the seminal fluid being deposited just within the labia far from the os externum. However, it must not be forgotten that many women have been impregnated without actual penile penetration, and without rupture of the hymen, the membrane remaining intact until accouchement. Therefore, persistent hymen cannot be accredited as a cause of infertility except in a relative sense. And the same statement will apply with equal force to vaginismus, vulvar eczema, pruritus vulvæ, etc., the woman in each instance most likely being potentially fertile and only relatively sterile.

Nymphomania, manustupration and sexual excess have heretofore been regarded as causative factors in infertility, but certainly the latter has been largely overestimated, since fresh recruits to the ranks of the *demi monde,* with whom excessive copulation is of necessity the rule, usually become pregnant several times before being rendered sterile from other well-known causes; likewise, girls who have practised masturbation for an indefinite period, have later married and produced healthy offspring. It is admitted without disputation that nymphomaniacs are fortunately hopelessly infertile; as a general rule, to which there have been few exceptions.

My views concerning treatment of infertility in the female, due to the various factors enumerated, will be reserved for a future dissertation.

UNUSUAL RESULT OF TRUSS WEARING.

A Case Report.

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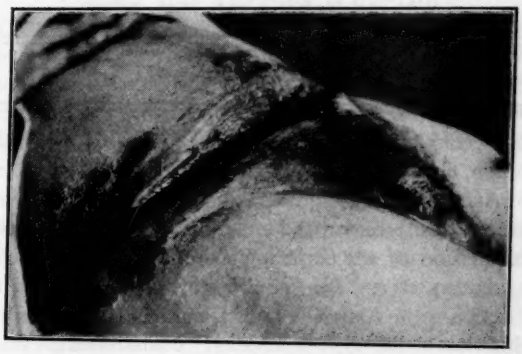
NEW YORK.

The following case is so unique in every particular, so unusual in occurrence, and possessing such incredible conditions, that it seems to justify publication. The case is a rare one in medical literature. After careful search I have failed to find a similar instance with such a gross destructive lesion.

H. D., a male, 37 years of age, was admitted to Bellevue Hospital on December 9, 1910, in the service of Dr. Joseph D. Bryant, in a very serious condition, with a temperature of 100°, which quickly rose to 104°, pulse 128, respirations 36.

It was learned from his friends that he had been missing for two weeks previous to admission, but it was impossible to ascertain just how long he had been ill, or the circumtances which surrounded the sickness. At any rate, it was very evident that whatever the conditions, he must have been unconscious or in such a mental state that pain made no impression upon him.

On admission he was stuporous and the abdomen was moderately distended; he appeared as if in a



typhoid state, with no other lesions on the body except the one described below.

He was wearing an old-fashioned, uncovered steel truss, which had a wooden pad. The truss, anteriorly, had penetrated the tissues, making a deep, clean cut wound, extending from one anterior superior spine to the other, in which it was buried. The wound involved the skin and superficial fascia, and, to varying degrees, the aponeurosis, in some places exposing the rectus muscle. The pad itself occupied a position on the left side behind the pubic bone, having cut through the rectus muscle with its sheath. The peritoneum had not been opened, having been pushed aside.

With some difficulty the pad was extricated and then the wound was inspected. The latter was smooth, no bleeding being anywhere present, the pressure having evidently been exerted gradually for a considerable period of time to bring about this unusual result.

The patient died the day after admission without a definite diagnosis having been made, and without any further information referable to his previous history having been obtained.

Clinical Data.—White blood cells, 22,400; polynuclears, 90%. A Widal test proved negative.

Urine: Dark, cloudy, acid, 1.025; many casts, albumen present, many triple phosphate crystals.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JULY, 1912.

SURGICAL INSTRUMENT PATENTS AND THE PRINCIPLES OF ETHICS.

At the meeting of the American Medical Association last month the House of Delegates adopted a revision of the Principles of Ethics as promulgated in 1903. An amplification was made of Section 4, in Article VI. of Chapter II., 1903. In addition to the denunciation of "commissions," this paragraph now states:

> It is also unprofessional to divide a fee for medical advice or surgical treatment, unless the patient or his next friend is fully informed as to the terms of the transaction. The patient should be made to realize that a proper fee should be paid the family physician for the service he renders in determining the surgical or medical treatment suited to the condition, and in advising concerning those best qualified to render any special service that may be required by the patient.

which is a sensible and ethical stand to take in this vexed question. The preceding paragraph (Section 3, 1903), advising the adoption of minimum fee rules in a community, was omitted in the final draft of principles this year—also sensibly, we think.

Although the principles were entirely rewritten, we find no other changes of importance. The two sets (1903 and 1912) differ chiefly in phraseology, in which respect the change has been by no means an improvement. Again, it is stated that these "principles of ethics" are only suggestive, but, in truth, they leave but little to good taste and professional instinct.

Chapter II., Art. IV., Sec. 2, reads:

> A physician should avoid making social calls on those who are under the professional care of other physicians without the knowledge and consent of the attendant. Should such a friendly visit be made, there should be no inquiry relative to the nature of the disease or comment upon the treatment of the case, but the conversation should be on subjects other than the physical condition of the patient.

Literally, this practically forbids the physician from making any "social calls," since almost everyone is more or less continuously "under the professional care of . . . physicians." It means, as it stands, that Dr. Jones should not call with his wife upon her friend, Mrs. Smith, until he secures from his hostess a list of her medical advisers and obtains the "consent" for his visit from Dr. Optic, Dr. Cervix and Dr. Cuttem, who are treating Mrs. Smith, respectively, for astigmatism, endometritis and ingrown toenail! Of course, in common sense the rule does not mean just what it says. Therefore, in common sense, why promulgate such a puerile paragraph?

Chap. II., Art. II., Sec. 4, of the 1903 Principles was:

> When more than one physician is attending another, one of the number should take charge of the case, otherwise the concert of thought and action so essential to wise treatment can not be assured.

which statement is as true as it is unnecessary. As revised this year the section reads:

> SEC. 3.—When a physician or a member of his dependent family is seriously ill, he or his family should select a physician from among his neighboring colleagues to take charge of the case. Other physicians may be associated in the care of the patient as consultants.

The only point we can find in this paragraph lies in the word "neighboring." Without that word it is, of course, the merest twaddle (it approaches that, anyhow); and with it, it is quite unreasonable. Why should a medical man, any more than a layman, be constrained to "select a physician from among his neighboring colleagues?" Why may he not feel at liberty to choose such talent as he prefers? Is this a rebuke to surgeons of New York City and Baltimore—not to mention many others—who betook themselves to Rochester, Minn., when they were surgically "seriously ill"? Were they violating ethics in not submitting themselves to the skill of "neighboring colleagues"?

But this editorial is not written primarily to point the peccadilloes in this primer of "principles." With one exception, they are all sound in purpose and spirit, however awkwardly expressed. It is to

that exception, viz., the ethical prohibition against holding patents on instruments, that we would draw especial attention.

Lest his motives be misinterpreted, the editor wishes to say that he does not hold or contemplate holding a patent on anything.

It is * * * derogatory to professional character for physicians to hold patents for any surgical instruments or medicines * * *

The above, a part of Sec. 8, Chap. II., Art. I, in the 1903 principles, was changed by the revision committee to read:

SEC. 5.—It is unprofessional, for personal profit, to hold patents for surgical instruments or medicines.

As altered by the reference committee and finally adopted, it stands:

SEC. 5.—It is unprofessional to receive remuneration from patents for surgical instruments or medicines * * *

The meaning of this is not at all clear. To patent a surgical instrument is not denounced. To receive a profit from an instrument (as by arrangement with the manufacturer) is not denounced. But to patent the instrument *and* receive a profit from its sale *is* denounced.

The ethical prohibition against patenting surgical instruments is a tradition that has been handed down from one generation to another, and its transmission from one "code" or "principles" to the next seems to us the illogical adherence to a tradition merely as such.

We can find but two reasons that might attach to such a tradition. The first of these lies in the spirit, taught by Hippocrates himself, that medical men should not seek to earn money from their colleagues. And in respect of medical treatment this spirit has been cherished from Hippocrates' time down. But this cannot logically be applied to profits from a surgical instrument; no one regards it as unprofessional or unethical for a medical author to accept royalties on his copyrighted book, or for teachers to accept fees for medical instruction (post-graduate or undergraduate).

The other, and probably the actuating, reason for the pronouncement against patents, is to prevent exclusive methods of treatment. It *is* unprofessional to conduct an exclusive or secret method of treatment, and a physician who patents an invention in order to conduct such a monopoly, or to derive an unreasonable profit from his device, is certainly unethical. But why not say simply that in our code? Why brand as unprofessional all those who patent a surgical instrument to assure its proper manufacture and to derive a reasonable royalty from it?

Since the manufacturer of an instrument or device will usually patent it, if the originator does not, the inventor deprives himself and his family of a share in the profit of his own work, without saving it to his purchasing colleague.

We hope that when our principles of ethics are next revised this section will be made to appear about thus:

It is a fundamental principle of our ethics that all medical discoveries by physicians should be published to the profession for the benefit of mankind, and that all instruments, apparatus, drugs or other means of diagnosis or treatment devised by a physician should be placed by him at the disposal of the entire profession. It is unprofessional to maintain by patent the exclusive use of any medical instrument or medicine, or to secure by patent an unreasonable profit from the sale of an instrument or medicine.—W. M. B.

FOURTH OF JULY INJURIES.

The campaign against the senseless firecracker, first consistently waged by the *Journal of the American Medical Association,* is winning out. In several cities Independence Day has been redeemed from its former noisy and dangerous attributes and is celebrated by ceremonies more appropriate and more instructive. Before many years, let us hope, the small boy and the toy cannon will cease to furnish the cover picture for July magazines. But reforms travel more or less slowly, and no doubt there will be many communities indeed where Independence Day will be celebrated this year as in years before, and it behooves the physicians of those communities to be prepared for the casualties that are bound to follow.

The treatment of extensive burns and of blinding injuries needs no extended comment. It is worth mentioning, however, that prompt relief of pain, not only by opiates and narcotics, but also, and especially, by local means, goes a long way towards preventing shock.

The removal of powder grains from the skin is often a difficult problem, involving sometimes the tedious picking out of each granule with a spud. Scrubbing the skin with a stiff brush, under anesthesia, will remove powder not too deeply embedded, and so will the application of a paste of beta naphthol 5.0; sulphur, 45.0; lard, 25.0; green soap to 100.0. Both the scrubbing and the paste must be employed cautiously however.

The penetrating blank cartridge and firecracker wound, however small, deserves scrupulous and prompt attention. It should be laid widely open and cleaned thoroughly, by curette, if necessary, of all fragments of clothing and especially of the

"wad," which is so often a tetanus carrier. Bruised fragments of muscles and fascia should be trimmed off clean, care being taken in cutting not to expose any nerves to possible tetanus infection.

When every angle of the wound has been cleaned, it should be swabbed out with tincture of iodine, and drained by an individual gauze packing. The part should be splinted in an abundant wet dressing. This treatment must be thorough and it can be so, as a rule, only when conducted under narcosis. It is, of course, most unwise at this time to sew severed tendons or opened finger joints. A prophylactic dose of tetanus antitoxine is an important part of the treatment.—W. M. B.

Surgical Suggestions

The history of a fairly sudden enlargement of a testicle does not necessarily mean an inflammatory or traumatic process. Such an enlargement may be due to spontaneous hemorrhage in a round-cell sarcoma of the organ.

Translucency in a scrotal swelling indicates, of course, the presence of hydrocele fluid. But if the shadow of the testicle within is unduly large the hydrocele is only a complication of some other condition, e.g., neoplasm of the testis.

A testicular enlargement, even though of rapid development, not associated with evident urethritis, not very tender and not following instrumentation, should never be dismissed as due to "a strain." It is in all probability neoplastic, luetic or tuberculous. If the Wassermann reaction is negative, the testicle should be promptly examined by operation!

A biliary fistula with patent cystic and common ducts may be used as a means of introducing medicaments or fluids into the bile tract or upper bowel.

Paronychiae may often be thoroughly drained by gently passing the knife point between the nail fold and the lunula without cutting the true skin. Disinfect with a drop of tincture of iodine, insert a tiny gauze drain and apply a small wet dressing.

If suppuration at the root of the nail does not soon subside after providing drainage, it may be necessary to remove the nail. This should not be done too hastily, however. Persistence in daily disinfection of the space (iodine, hydrogen peroxide, etc.) and stimulation of the tissues (as by massage) will often be rewarded by saving the nail.

Surgical Sociology

Ira S. Wile, M.D.
Department Editor

Few terms possess more common usage to-day than the words "fatigue" and "efficiency." The possession of the former and the lack of the latter are quite characteristic of our industrial life. For the most modern presentation of the physiologic, psychologic, sociologic and economic factors entering into the relation between fatigue and efficiency, the recent study of "Fatigue and Efficiency, a Study in Industry," by Josephine Goldmark, published by the Russell Sage Foundation, demands the attention and careful reading of every thoughtful physician.

The practical value of physiology is demonstrated daily in the application of medical and surgical procedures. The utilization of physiologic principles to the investigation of industrial life reveals many facts of the utmost importance to the industrial workers and the community. Fatigue has been considered a danger existent in occupation. The lowered vitality consequent upon the long day of the worker in unhygienic surroundings has at last been placed upon a chemical basis. According to Lee, fatigue results from the accumulation of waste products within the system, and the responsible chemical substances are thought to be sarcolactic acid, monopotassium phosphate and carbon dioxide. Weichardt has for several years claimed that he has isolated an actual toxin of fatigue and recently stated that he had formed an antitoxin.

The vital effect of the accumulation of fatigue products is to ennervate the worker. To accomplish the same effort while in a state of fatigue increased nervous energy is essential, and the result is a drawing upon the reserve force of the individual. The continued action of fatigue products is to produce not the normal fatigue that is relieved by moderate rest, but to induce a more or less chronic state of pathologic fatigue which is marked by neurasthenic and psychasthenic symptoms.

The recent development of scientific management has demonstrated that with properly timed adequate rest, the productivity of workers may be increased by lessening fatigue, and increased output may be secured from workers during the same unit of time. In order to conserve working power, it is essential to secure physiologic rest before it becomes impossible to eliminate the saturating fatigue poisons.

The problems of industry to-day vary greatly from the problems of twenty-five years ago. The increased speed, the gearing of the worker up to machines, the marked monotony of effort due to increased specialization in industry, the noisiness of machine occupations, have all brought an increased hazard to workers through the fatigue of

attention, the retardation of sense impressions, and the exhaustion of muscular control.

Recently there has passed through the Senate and House a bill requiring that labor on government contracts should involve an eight-hour day. The relation of hours of labor to accidents has received considerable attention in other countries, but the figures in the United States are lacking. The Imperial Insurance Office of Germany has shown that the highest accident rate for all industries occurs between 10 and 12 a. m. and 5 and 6 p. m. Taking the entire figures for the year 1887 it was found that 20.68% of all the accidents during the year occurred between 10 and 12 a. m. and 16.13% occurred between 4 and 6 p. m. Professor Imbert, in France, taking the accident curve of over 140,000 workers found that the high places in the curve were reached between 10 and 11 a. m. and 4 and 5 p. m. The Illinois Department of Factory Inspection during 1910 found that the acme of the curve of accidents was reached practically at the same period of time within the State of Illinois. Bogardus, considering the figures of Illinois, commented that 82.2% of the accidents "conceivably might have been avoided if the injured or the fellow servant who was the cause of the accident had had accurate muscular control." A marked factor in causing the lack of muscular control is the long hours of labor.

The June meeting of the American Medical Association marked a step in advance by reason of the fact that there was a conjoint meeting between the physicians and the American Association for Labor Legislation to consider industrial diseases. It seems as though the physicians could throw much light upon the relation between hours of labor and injuries if in the histories of surgical patients the time at which the accident occurred were noted, as well as the number of hours during which the patient had been engaged in work on the day of the accident. The exact nature of the work followed at the time of the accident might well be considered. The surgical profession can assist in the acquisition of valuable statistics relating to industry and accidents if all hospitals in industrial centers would adopt a uniform blank for the registration of the industrial factors relating to accidents.

The effect of hours of labor has been recognized by the New York Bureau of Labor Statistics which reported in 1909 that accidents occurred two or three times as frequently during the fifth hour of work as in the first hour. The report of the Massachusetts Bureau of Labor Statistics as long ago as 1870 claimed "reduced hours of labor have a great tendency to improve one morally, mentally and physically—a person will under continual long hours either succumb from want of physical power, or become a mere brute not having time to think, visit or do anything that would tend to personal improvement." With our present social advance we recognize that life consists of more than work and sleep.

Crystallized effort to secure an eight-hour working day for men is built upon strong foundations of physiology and redounds to the public health. It is a sad commentary upon human chivalry that while the fight has been waged for an eight-hour work day for men, the greater importance of an eight-hour work day for women has received inadequate thought, and legislatures have been content to wrestle with the weighty problem as to whether a ten-hour working day is too long for women.

From the economic side productivity has not been found to be lessened by the institution of the short day. The effect of the long hours is manifest in the abnormal and unnecessary percentage of accidents, the tremendous loss in wages due to minor physical ailments, the unwarranted infant mortality, the great increase of miscarriages, the banal effects of alcoholism, and the consequent moral degeneration of the workers. A reasonable physiologic working day would tend to lessen poverty, decrease dependency and lessen race deterioration. Fatigue and inefficiency go together. Physiologic rest with the consequent conservation of human power will lessen both the tax on the worker and the taxes on the community.

The Fifteenth International Congress on Hygiene and Demography will be held at Washington, D. C., September 23 to 28, 1912, under the auspices of the Government of the United States. It is needless to comment upon the fact that the forthcoming Congress is of special importance to the Government and citizens of the United States. Not alone will the most distinguished foreign sanitary experts be present, but for the first time all the States will be united in an endeavor to present the hygienic methods and results of this country. A special opportunity has therefore been created for permanently improving conditions relating to health as it concerns the people of the United States. The educational value of the exhibition being arranged is inestimable. Of special importance will be the development of the following themes: Vital Statistics and Demography, Industrial and Occupational Hygiene, State and Municipal Hygiene, Hygiene of Traffic and Transportation, and Sex Hygiene. The section on Industrial and Occupational Hygiene will consider the physiology and pathology of work and fatigue, the occupational diseases, accidents and their prevention, dangerous trades and processes, and various other subjects of social and surgical importance.

The interests of the surgical profession will be subserved by attention to some of the papers on the provisional programme relating to the diseases and accidents of miners and tunnel workers, electric generator workers and metal workers, industrial plumbism, the reporting of industrial accidents, occupational anthrax, alcohol as a predisposing cause to accidents and occupational diseases, and safety devices in the prevention of accidents.

As this is the first time the International Congress will have been held in this country, the support of the profession should be most liberal.

Book Reviews

Essai Sur l'Anatomie et la Medicine Opératoire du Tronic Coeliaque et de Ses Branches, de l'Artère Hépatique en Particulier. By P. DO RIO-BRANCO, former Interne of the Hospitals of Paris. Paris: G. STEINHEIL, 1912.

In this work of 830 pages the author presents his study of the anatomy and surgical anatomy of the coeliac trunk and its branches. The study has been a most painstaking and complete one. As a result we have in this book a permanently valuable reference whenever practical or purely anatomical knowledge of the subject is desired. The volume is in no sense a text-book. It is, we believe, a foundation on which the operative surgery of the coeliac axis and its branches will be built whenever the time for the feasibility of such surgery shall arrive. In the meanwhile the work is of little practical interest except that portion dealing with the hepatic artery. We believe that every abdominal surgeon should study the numerous anomalies of that vessel which have been discovered by Rio-Branco, for, as the author demonstrates, such knowledge may be of great value in operations upon the common bile duct.

The work is profusely illustrated with clean-cut drawings and diagrams, for the most part original.

Biological Aspects of Human Problems. By CHRISTIAN A. HERTER, M.D. Duodecimo; 344 pages. New York: THE MACMILLAN COMPANY, 1911.

The draft of this volume was left in an uncompleted form by the lamented author before his death, and is now arranged and edited by his wife. Herter makes the rather novel attempt to regulate human conduct and ethics according to strict biological data. It is manifest therefore that the author must have been a strong believer in the mechanistic theory as opposed to "vitalism." Whether the present is suffciently ripe for a comprehensive interpretation of human conduct along biological lines is debatable. At all events, this attempt of Herter's is highly impressive; indeed, the author acknowledges that his thesis is only an attempt, and suggests that with wider knowledge and new generalizations a code of ethics based upon pure biology may become a practical consummation. The book is one of the most stimulating and suggestive of recent years.

A Cyclopedia of American Medical Biography. Comprising the Lives of Eminent Deceased Physicians and Surgeons from 1610 to 1910. By HOWARD A. KELLY, M.D. In two large octavo volumes of about 500 pages each; illustrated with portraits. Philadelphia and London: W. B. SAUNDERS COMPANY, 1912.

That prolific and industrious author, editor and compiler, Prof. Howard Kelly, has added with this cyclopedia two more large volumes to the numerous and varied works whose title pages bear his distinguished name.

The preparation of the biographies of eminent deceased American physicians and surgeons was a worthy task, the completion of which has provided "a handy reference work for medical generations yet unborn."

The stories of "upwards of 1,200 worthies" who lived and died in American medical history from 1610 to the end of 1910 are to be found here set down in interesting detail, several of them with portraits.

These biographies were prepared by over 200 authors who collaborated with Kelly, many of them supervising the collection of data from large geographical districts, or taking charge of individual specialties, *e. g.*, anatomy, laryngology. Much of the work is, of course, based on local medical histories and on standard biographical volumes.

There is an interesting introduction of about 75 pages, briefly sketching the history in America of anatomy, surgery, gynecology, obstetrics, dermatology, ophthalmology, laryngology and medical jurisprudence, and of women in medicine.

Many of the names in this cyclopedia are unfamiliar to the individual reader. Their owners were not all famous, but they all left a mark on the profession, albeit their reputation was in some cases only local.

It could hardly be expected that the first edition of a cyclopedic biography would be free from omissions. As we glanced through these pages we noted the absence of the names of the following illustrious New York physicians: (Morris) Asch, Krakowiczer, Lustgarten, Noegerath, Sands. This work is an enduring one; new issues will be needed every few years; and with the preparation of the next edition the omisions in the first will no doubt be provided for.

Medical Service in Campaign. A Handbook for Medical Officers in the Field. By MAJOR PAUL FREDERICK STRAUB, Medical Corps (General Staff), United States Army. Prepared under the direction of the Surgeon-General, United States Army, and published by authority of the War Department. *Second Edition.* Duodecimo; 186 pages; 13 illustrations. Philadelphia: P. BLAKISTON'S SON & CO., 1912.

The second edition of Major Straub's book incorporates the experiences gained in further instruction at the Army War College and with the sanitary units of the troops recently immobilized in Texas. It is essentially a volume devoted to the teaching of officers of the regular Army and National Guard and implies some fundamental understanding of military tactics.

Military authorities have at last realized the vital importance of scientific sanitation, and everyone is now fully awake to the fact that stringent sanitary measures have saved many lives. It is therefore of the greatest importance that officers in the field receive the fullest instruction in a branch of the service which has been most neglected.

The volume is neatly bound in limp leather, well written, and deserves general commendation.

On the Physiology of the Semicircular Canals and Their Relation to Seasickness. By JOSEPH BYRNE, A.M., M.D., LL.B. Small octavo; 569 pages. New York; J. T. DOUGHERTY; London: H. K. LEWIS, 1912.

During the past six years the author has tried various experiments in relation to seasickness. He believed that the semicircular canals were in some way involved in the causation of this malady and undertook a series of experiments, using rotations, aural irrigations, stimulation of the retina by strong light, galvanism applied to the mastoid areas, etc., to determine whether by such means phenomena resembling those of seasickness could be produced. By means of this study he has definitely proved, almost beyond a doubt, that the distressing symptoms of this illness are produced through changes in the small canals of the internal ear.

It is seldom that a volume is presented which works out so clearly and thoroughly the proof of a single problem. Monographs on this subject are not rare, but as a rule they prove little and do not give as distinct a conception of this subject.

The observation of phenomena of rotation are extremely interesting. The author concludes (1) that rotation profoundly affects the stomach, and presumably the intestinal functions, as manifested (a) by persistent closure of the pylorus; (b) by congestion of the gastric mucous membrane; (c) by impaired secretion of gastric juice; (d) by nausea and increased salivary flow; (e) by general distress and wretchedness; (f) by eructations, passage of flatus, etc., and vomiting. (2) That these disturbances are initiated primarily by irritation and irregular stimulation of the labyrinthine receptors. (3) That when rotation sickness has been induced, the presence of food, etc., in the stomach tends to maintain and aggravate the condition until it is ejected.

In the chapter on drugs for the relief of seasickness the writer gives the following suggestions: Atropine and strychnine aid in relaxing the pylorus, especially in the recumbent posture (this combination is especially effective in combating nausea, increased salivation and vomiting and the physical and mental depression); that atropine, *per os*, and hyocyamine hypodermatically are effectual in coun-

teracting some of the symptoms, but not to the same degree as atropine or the combination of atropine and strychnine used hypodermatically; that cocaine and orthoform *per os* are ineffective, while hyocine hypodermatically is not only ineffectual but seems to aggravate the phenomena; that certain extracts made from the various parts of the mucous membrane of the stomach are effectual and materially favor absorption and motility of the stomach and intestines.

We are pleased to note that the author has not lost sight of the fact that the cerebellum plays a very important part in equilibration. "The cerebellum. by means of its afferent and efferent peripheral relations, constantly holds the mucous membrane involved in equilibration, in a state of tone, ever ready to respond to impulses originating from change of position or other stimulus." To show the relation of the cerebellum to the semicircular canals, the author states that the peripheral end-organs of the vestibule and semicircular canals are mainly in crossed relation with the cerebellum through the vestibular nerve.

The International Medical Annual. 1912. A Year Book of Treatment and Practitioner's Index. Duodecimo; 654 pages; 113 illustrations. New York: E. B. TREAT & Co. Price, $3.50.

It is beyond the scope of a review to cover fairly the text of the International Medical Annual, for the latter is a review of the advances that have been made in medicine and surgery in the year. The work, however, is something more than a review, for the subject matter is sifted and carefully analyzed by many prominent contributors. The Annual is, as it always has been, an admirable work well edited for ready reference by the practitioner who has but limited time to inquire into the most recent advances in medicine. We wish to call the attention of the editor of the Annual to our inability to find any reference to the advances made in thoracic surgery in the past year; the practical application of the Meltzer-Auer insufflation anesthesia should surely be noted.

Practical Electro-Therapeutics and X-Ray Therapy. By J. M. MARTIN, M.D. Octavo; 446 pages, 219 illustrations. St. Louis: C. V. MOSBY Co., 1912.

This book, designed chiefly for the student and general practitioner, may well be said to fulfill the requirements in a branch of therapy that is employed more extensively than it is properly understood. At the outset the reader is introduced by a few brief chapters into the essentials of electricity, electric currents, methods of creating an electro-motive force, magnetism and electro-statics. These are of great help to the beginner in grasping the subject of electro-therapeutics. He is, furthermore, acquainted with the parts and workings of an *x*-ray apparatus and the methods of applying the direct current to the human body, and with high frequency currents. Several very illuminating chapters on the location of foreign bodies, especially in the eye, and the concluding chapter on the medico-legal aspect of the *x*-ray are valuable features of this practical reference book.

Manual of Style. *Third Edition.* Duodecimo; 268 pages. Chicago: THE UNIVERSITY OF CHICAGO PRESS, 1912. Paper, 85 cents; cloth, $1.12, postpaid.

We recommend to all medical men who occasionally or frequently contribute to journal or textbook literature an investment in this or some similar manual. It contains valuable instructions in composition, capitalizing, hyphenating, use of italics, paragraphing, proofreading, etc. If all contributors were familiar with these matters it would help to save editors from premature canities.

Augustus Charles Bernays. A Memoir. By THEKLA BERNAYS, St. Louis: C. V. MOSBY Co., 1912. Price $2.

An interesting and intimate memoir of the late St. Louis surgeon, written by a constant companion, his sister.

BOOKS RECEIVED.

The Care of the Insane and Hospital Management. By CHARLES WHITNEY PAGE, M.D., formerly Superintendent Danvers State Hospital, Massachusetts, etc. Duodecimo; 155 pages. Boston: W. M. LEONARD, 1912.

Progress in Surgery

A Résumé of Recent Literature.

Chloroform Narcosis and the Suprarenal Capsule. (*Chloroformisation et Capsules Surrénales*). P. DELBET, A. HERRENSCHMIDT and A. BEAUVY. *Revue de Chirurgie*, April 10, 1912.

This question has been experimentally and clinically studied by the authors over a period of two and a half years. The experimental aspect of the work was concerned with the manner in which chloroform is fixed by the suprarenal capsule, the action of chloroform on the cortical (fatty) portion of the adrenal, and the action of the narcotic on adrenalin and the chromaffin substance. The practical result of the study is that adrenal extracts should be administered to chloroformed subjects, whether the suprarenal capsule shows evidence of weakness or whether it gives evidence of struggle and consequent reaction. The effect of prolonged chloroform administration on the medullary portion of the adrenal is diminution and even disappearance of both chromaffinity and adrenalin.

Delbet has administered adrenalin to more than 1,000 chloroformed patients. The results have been splendid. He believes that adrenalin unquestionably regularizes the narcosis and diminishes (in most cases eliminates) post-operative shock.

Diagnostic Aids in Surgery of the Renal Pelvis and Ureter with Special Reference to Pyelography. W. F. BRAASCH, Rochester, Minn. *The Lancet-Clinic*, May 18, 1912.

Braasch discusses radiography, meatoscopy, ureteral catheterization and pyelography, and brings out a number of interesting points. With good technic and proper interpretation every renal stone should be shown in a radiograph. In the lower ureter, however, in 5 to 10 per cent. of the cases, the stone may be missed. If the *x*-ray plate shows a shadow along the urinary tract there must be some calcareous substance present to cause it, and it is here that the other diagnostic aids, especially cystoscopy, come into play to help one correctly interpret the findings.

The cystoscopic picture of the ureteral meatus is of great assistance. The meatus appears edematous and irritated when a stone is lodged in the bladder section of the ureter. The stone itself may be seen. Cloudy urine, with a shadow in the radiograph on the same side frequently means a stone. With a stone low down in the ureter there is frequently a reflex anuria lasting 10 to 15 minutes, which may be misinterpreted. A ureteral stone may cause very purulent urine when at operation the kidney shows very little if any disease of its tissue.

Ureteral catheterization is of value not only for separating urines, but for giving information as to the patency of the ureter. Stone in the ureter will obstruct the catheter in more than 75 per cent. of the cases. In over 50 per cent. of these the obstruction can be passed and a sense of grating obtained. Evidence of hydronephrosis may be obtained by noting the amount of urine obtained after passing an obstruction. By injecting fluid into the pelvis the capacity may be measured, and any pelvis which contains more than an ounce of fluid without causing pain may be considered a surgical hydronephrosis.

Braasch has used pyelography (the radiographing of the kidney after injecting the pelvis full of a collargol solution) at St. Mary's Hospital with markedly good results. It is of special value in cases where a ureteral obstruction will not permit the passage of a catheter, but will still allow the passage of fluid. It offers the only means of diagnosing a ureteral dilatation above an obstruction. It reveals the fact that dilatation of the pelvis is the usual accompaniment of its inflammation, and is also of value in demonstrating how much kidney tissue is still present. In the case of renal neoplasms, about two-thirds of the cases coming to operation have shown recognizable changes in the pelvis. Pyelography is of great use

in demonstrating congenital anomalies of the kidney and ureters, such as horseshoe kidney, branching ureters, etc. In these cases it may be the sole means of diagnosing them. Pyelography at times may be painful, but the author has seen no cases in which any injury or harm has followed its use.

Experimental Study of the Effects of Ureteral Obstruction on Kidney Function and Structure. EDWIN BEER, New York. *The American Journal of Urology*, April, 1912. *American Journal of Medical Sciences*, June, 1912.

The primary object of this experimental study was to determine the length of time a ureter could be ligated without the kidney losing its functional activity. The author's conclusions are as follows:

1. Infection of a non-stenosed ureter may lead to a hydronephrosis. Perhaps this explains some of the cases of hydronephrosis in which no mechanical cause is found.

2. Infection of the ureter rarely leads to abscess formation, to multiple abscesses of kidney, unless the ureter is stenosed and then only when the injected organisms are virulent.

3. Aseptic ligation of ureter leads regularly to a primary hydroureter and at about three weeks atrophy and shrinkage of hydronephrotic sac begins.

4. The idea that the use of catgut ligature material in pelvic work will not cause a permanent ureteral stenosis, if this organ is tied off, is erroneous.

5. Three to four months after ligation of the ureter the kidney is represented by a small fibrous mass, provided infection is not present. If infection is introduced a huge hydronephrotic sac without vestige of parenchyma results.

6. In fact of infection stones readily form both in pelvis and bladder.

8. After three weeks exclusion sufficient parenchyma persists to warrant an attempt at secondary implantation of the ureter into the bladder.

Injection of Parraffin for Incontinence of the Urine Following Trauma of the Urethra. E. H. EISING, New York. *Medical Record*, April 27, 1912.

Eising reports two cases of complete cure of hitherto intractable cases of incontinence of the urine in women. In the first patient, one injection of paraffin parallel to and along the urethra sufficed; in the second, three injections were necessary. Eising employed ordinary commercial paraffin. No special syringe is necessary.

Reconstruction of the Urethra by Circular Urethrorrhaphy with Diversion of the Urine. (*De la Reconstitution de l'Urètre par Urètrorrhaphie Circulaire avec Dérivation de l'Urine.*) G. MARION, Paris. *Journal d'Urologie Médicale et Chirurgicale*, April 15, 1912.

In order to obtain permanent results in reconstructive operations on the urethra all irritation and all sources of infection must be avoided. The author therefore performs a uretherostomy or cystostomy in every case of urethrorrhaphy. The operation is indicated in: 1. Rupture of the urethra. 2. Extensive traumatic and inflammatory stricture, in which cases the diseased area must first be excised. 3. Urethroperineal fistulae.

The author operates upon the last mentioned condition in the following manner: A median incision is made, disregarding the orifices of the fistulae. After having exposed the bulb and the corpus spongiosum and isolated them, the fistulous tract or tracts are widely excised down to the urethra. The diseased portion of the urethra is now easily recognized. It is excised as widely as necessary, and the two stumps of the divided urethra are carefully examined to make sure they are normal. The pendulous portion of the urethra is then mobilized and is fixed by two sutures to the ischiorectal fascia in order to prevent retraction of the urethra. This is a capital step of the operation. A sound is now passed through the ends of the urethra as a guide, and the circular suture is made. None of the sutures should penetrate into the lumen. A urethrostomy is established a good distance proximal to the line of anastomosis. The sound is removed and the superficial layers of sutures are placed.

The modification of the technic for cases of ruptpre of the urethra and of stricture formation can be readily understood. The results of this method of reconstruction of the urethra have, in Marion's hands, been exceedingly gratifying.

A Brief Account of Malignant, Blastomatous Changes in Uterine Myomata and Myomatous-Uteri, Etc. (*Kurzer Bericht über . . . malignen blastomatösen Veränderungen der Uterusmyome und myomatösen Uteri, Etc.*) J. SCHOTTLAENDER, *Zeitschrift für Gynaekologie*, Nov. 20.

During the past three and three-fourth years 335 myomatous uteri came to the laboratory of the II Universitats-Frauenklinik of Vienna for examination. The specimens were removed from patients suffering from symptoms that were referable to the myomata. Of the series five specimens were studied microscopically and escaped histologic examination. Of the 330 cases in which careful histologic study was made 11 showed the so-called myosarcomatous change, *i. e.*, in 3.3 per cent. of the cases. This percentage would almost correspond to that of Winter's series (3.6 per cent. of 753 myomata). In only one case had metastasis occurred. Carcinoma was present 20 times, *i. e.*, 6 per cent., and attacked the cervix in the great majority of cases. Schottlaender questions the occurrence of metastasis in benign myomata. The foci of malignant degeneration may be very small and scattered and escape clinical diagnosis. The study would seem to have a bearing on the indication for the use of *x*-ray in the treatment of myomata.

Concerning the Importance of Tentorium Tears in the New-Born (*Ueber die Bedeutung der Tentoriumrisse für das neugeborene Kind*). A. BAUREISEN, *Muenchener Medizinische Wochenschrift*, May 7, 1912.

In 47 fatalities among the new-born Bauereisen could determine the cause of death as directly referable to tears of the tentorium. The tears are divided into supratentorial and infratentorial. The later cause hemorrhage into the cerebellum and medulla oblongata, and are the more serious, in the majority of cases resulting fatally. The supratentorial hemorrhages involve the cerebrum, and are more amenable to surgical treatment. Operative procedures to deliver the child are responsible for 60 per cent. of the lacerations; 40 per cent. occur in children born spontaneously. These are apt to be premature children, in whom the predisposition to lacerations is more marked. The tentorium cerebelli is the weakest point, and is especially apt to give way in lateral compression of the head.

The symptoms of supratentorial compression are: restlessness, crying, tension of the large fontanelle, pallor of the skin, paresis of the hypoblossus (deviation of the tongue toward the paralyzed side) and of the spinal accessory nerve (spasmodic turning of the head toward the paralyzed side, later paralysis). Trephining and removing the blood masses have been followed by success in some cases (Cushing and Seitz). In the event of an infratentorial laceration and hemorrhage the child is quiet, shows disturbances of the respirating center, rigidity of the neck, bilateral clonic spasms, and lumbar puncture shows bloody fluid.

The Schultze method of artificial respiration is absolutely contraindicated in all cases of asphyxia of the newborn, as its manipulation only aggravates any tentorial hemorrhage that may be present. To be preferred is Ahlfeld's procedure, in which the respirating passages are cleared and the child is held in warm water until breathing sets in. Stimulation of the skin promotes the onset of respiration.

Artificial Fecundation (*Ueber künstliche Befruchtung*). A. DÖDERDEIN, *Muenchener Medizinische Wochenschrift*, May 14, 1912.

Döderlein reports the successful artificial impregnation of a patient 24 years old, married six years. All other treatment, dilatation, curettage and cervix plastics being of no avail the patient submitted to the trial of an artificial fecundation. The semen was obtained through coitus condomatosus; the patient placed upon the examining table, and under aseptic precautions the semen contained in the condom was taken up into a Braun intrauterine

syringe and injected into the uterus. Döderlein prefers to inject one day before an expected menstrual period and one day following the same period. In six cases in which Döderlein tried this technic one was successfully impregnated, and when last seen was in the fourth month of pregnancy. In this case only one injection, that before the menses, was sufficient. The entire quantity of semen need not be used, as two or three drops properly placed in the uterine cavity contain an ample number of spermatozoa for fertilization. Döderlein also reports successful results in the hands of other surgeons.

Sterility. WILLIAM H. CAREY, *International Journal of Surgery,* May, 1912.

Carey considers the lesser semen defects and minor lesions of the female generative tract, as causative factors in a very interesting article. Some of his conclusions are as follows:

1. One of every four sterile marriages is due to the sterility of the husband.

2. To determine accurately the fecundating power of the semen, not only must the presence and activity of spermatozoa be determined, but a careful study must be made, noting the percentage of inactive, immature and deformed cells. When present and associated with oligospermia the fertility of the semen is much impaired.

3. Increased acidity of the vaginal secretion is unfavorable to fecundation.

4. Sexual compatibility is not essential to fertility, but undoubtedly favors it.

5. Prolonged successful prevention of pregnancy is sometimes followed by permanent sterility.

Some Observations on the Vaginal Removal of Submucous Fibroids. SAMUEL W. BANDLER, *International Journal of Surgery,* May, 1912.

The vaginal approach in the removal of a submucous fibroid is rendered comparatively easy by the use of an inverted T-shaped incision in the anterior fornix, by the aid of which the bladder is completely separated from the anterior wall of the uterus and from the anterior vaginal wall. To this incision the additional splitting of the uterus anteriorly, and, if necessary, posteriorly, facilitates the removal of submucous fibroids more especially, and also other varieties, provided they are not multiple and too large. The uterus may readily be served as in cesarian sections. If the uterus be such as to warrant a hysterectomy, this can then be carried out by hemisection.

Normal Human Blood Serum in Obstetric and Pediatric Practice. J. EDGAR WELCH. *American Journal of Obstetrics,* April, 1912.

Welch states that the subcutaneous injection of alien serum for a nutritional effect is associated with many untoward symptoms, some of which are directly harmful. Hernologous serum injected subcutaneously does not produce any of these disagreeable symptoms, and in Welch's experience is a very useful measure in premature infants and in cases of malnutrition. In bleeding conditions, and especially in the hemorrhages of the new-born, the use of normal human serum may be regarded as a specific remedy. Welch has tried this in 32 cases of hemorrhagic conditions with most gratifying results. In septic conditions normal human blood serum appears also to have considerable value, while in the post-operative hemorrhage of deeply jaundiced individuals injections of normal serum have proven of great value. The advantage of the injection of normal serum over other methods, chiefly transfusion, is that it can be repeated frequently and used indefinitely (5 to 7 ounces daily in adults). The exception is cases of very marked depletion from prolonged hemorrhages in which the cellular elements of the blood are greatly diminished, when transfusion is the only measure to use, for in this operation we supply the cells necessary to the blood, which are entirely lacking in any serum we may administer.

The Treatment of Tuberculous Peritonitis in Adults. A Record of 31 Cases. F. M. CAIRD, Edinburgh. *Edinburgh Medical Journal,* April, 1912.

Caird describes four types: 1. Exudative form, 2. Exudative form with adhesions. 3. Dry form. 4. Any forms in which the peritoneal cavity is practically obliterated or tubercle has invaded the bowel coat. The operation practised in all cases was simple laparotomy. An attempt was made to find and remove any prominent forms, and on a few occasions diseased tubes and ovaries were removed. Twenty-eight of the 31 cases recovered from the operation. Of the 18 cases that could be followed, nine died after varying intervals; eight are well, dating from periods of one to nine years after operation.

The Significance of Blood in the Stools. J. M. T. FINNEY, Baltimore. *Surgery, Gynecology and Obstetrics,* April, 1912.

In a recent interesting and instructive article, Finney protests against the prevailing tendency to jump to quick and easy conclusions drawn from certain insufficient clinical data. Laboratory aid should be resorted to in all obscure cases, and, in the opinion of Finney, to fulfil the requirements in the investigation of such cases, "the aid of the despised laboratory man is indispensable." The mere presence of blood in the stools, while not of pathognomonic importance in an otherwise obscure affection, may be of most varied and unusual significance. In general, the great and important group of cases in which blood originates from sources below the cardia of the stomach may be subdivided into several classes, depending upon their pathological basis: 1. Trauma. 2. Disorders of the gastro-intestinal tract proper (a) mechanical disturbances, (b) functional disturbances, (c) inflammatory lesions (d) new growths, benign and malignant (e) circulatory disturbances. 3. Bleeding due to some disease of the organs directly connected with the gastro-intestinal tract. 4. Bleeding due to heterogeneous causes as lesions of the blood-vascular system.

It is interesting to note that Finney calls attention to the association of blood in the stool with gall-stones in the gall bladder in cases without the presence of jaundice, ulceration or fistula into the gastro-intestinal tract.

The Recognition of Lymphatic Pseudo-Appendicitis (*Zur Kenntniss der Lymphatischen Pseudo-Appendizitis*). V. LIEBLEIN, Prague. *Wiener Klinische Wochenschrift.*

Lieblein reports three cases. One presented the symptoms of an acute appendicitis; the other two of the chronic type. The appendices after removal showed no histological evidences of acute or chronic inflammation. There was, however, a pronounced swelling of the lymphatic tissue. He believes that this swelling produces tension on the muscular coats and thereby causes pain. The recognition of this malady belongs to Miloslavich, although Aschoff in his monumental work on "Appendicitis" gave it attention. The malady occurs in young individuals of the lymphatic habitus, and removal of the appendix affords prompt relief.

The Surgical Treatment of Intestinal Stasis. JOHN YOUNG BROWN, St. Louis. *Interstate Medical Journal,* May, 1912.

In a short article Brown comments on the fact that there is considerable weight of opinion in favor of the view that the large intestine is a more or less useless organ. He himself has had occasion to observe six cases in which there was complete exclusion of the large gut without any untoward symptoms. One of these, in which the ileum had been anastomosed to the sigmoid, had remained in perfect health for nine years. It has been claimed that in such cases the patient loses water which would normally be absorbed by the intestine, and that he therefore suffers from thirst, but Brown has seen no such symptoms.

During the past three years the author has operated on 16 cases of auto-intoxication, showing symptoms of headache, malaise, backache, anorexia, loss of weight, nausea and vomiting, obstinate constipation and occasional attacks of diarrhea. Following the pathology which has been worked up by Lane and by Jackson, he believes that these symptoms are due to absorption of toxins from the large gut. To obviate this he excludes the colon and does a lateral implantation of the ileum into the sigmoid. In nine of these 14 cases there was marked improvement. He concludes, however, that "neither the Lane operation nor any of the suspension operations should be

undertaken unless there are present well-defined demonstrable pathological lesions justifying their performance. All so-called atonic and neurasthenic types of enteroptosis will yield far better results if given proper rest, hygienic and dietetic treatment."

Chronic Focal Infections and Their Etiologic Relations to Arthritis and Nephritis. FRANK BILLINGS, Chicago. *Archives of Internal Medicine*, May, 1912.

Billings has found in many cases of chronic arthritis and nephritis foci of infection which in his view are the sources of the malady. In many instances astounding results follow the removal of the focus. The most common foci are the tonsil, the lymphoid tissues of the pharynx, abscesses of the gums, pyorrhea alveoloris, gingivitis and the sinuses of the head. Other foci which he classifies are: bronchiectatic cavities, chronic ulcers of the gastrointestinal tract, chronic appendicitis and cholecystitis, infections of the urinary tract and genital tract, and, finally, local submucous or subentaneous infections anywhere in the body. He reports in detail ten cases of arthritis and six cases of chronic parenchymatous nephritis which illustrate his thesis. It is interesting to note that the streptococcus obtained from many of these patients, when injected into animals, very frequently caused an arthritis of the deforming type.

End Results of 66 Platings. Remarks on the Treatment of Fractures of the Long Pipe Bones. E. A. BABLER, St. Louis. *Journal American Medical Association*, May 25, 1912.

Babler finds that the greatest danger of plating is infection and consequent osteomyelitis, and in all cases of compound fracture of the tibia, fibula, radius, ulna and clavicle the plate should be removed as soon as possible. It should never be placed immediately under the skin. Plating yields the best results in simple fracture of the humerus and femur providing all precautions are taken to prevent infection. A snugly fitting cast should be applied immediately after plating, and this done as carefully as the plating itself. Plating is not recommended except in cases in which the skiagraph shows that it is advisable, since it is impossible always to avoid infection. He goes over several of the special conditions in which the method is applicable in particular. In his 61 patients with 66 platings there were 35 plates removed, 26 perfect functionating results; one death was due to post-operative pneumonia, one to shock following a second plating and two to sepsis. Plating, he says, yields the best results in cases (a) of non-union; (b) of compound fracture with considerable displacement, and (c) of simple fracture of the humerus and femur, in which the skiagraph indicates the inefficiency of the closed treatment. "Plates should never be placed immediately beneath the skin unless we expect to remove them. I seldom or never plate the clavicle, radius, ulna or fibula, since the absorbable wire is preferable. The character of the fracture and the skiagraph findings indicate the proper treatment in any given case of fracture of the long pipe bones."

Knee-Joint Tuberculosis in the Adult. LEONARD W. ELY, Denver. *Denver Medical Times and Utah Medical Journal*, May, 1912.

From the study of a large number of specimens the author concludes that tuberculosis of a joint originates either in the synovial membrane or in the red marrow of the bones. At no time are the bony trabecular structure or the cartilage or ligaments involved. The yellow marrow is practically also never affected. In the knee the synovia and the red marrow in the bone ends owe their presence here to function in the joint, and nature attempts to cure the disease by depriving the joint of function. When the joint is absolutely rendered functionless by resection, the synovia undergoes fibrous change, the spongy bone becomes dense and the red marrow becomes yellow. According to this theory curetting and trying to remove diseased tissue is incorrect. The treatment recommended by the author is as follows: Allow six months with knee in plaster. If ankylosis and cure has not then taken place operate. The operation consists of a transverse incision, sawing through the patella, dissecting this out or leaving it in, sawing off about one-half inch from the condyles of the femur, chiseling off the very tops of the tuberosities of the tibia, suturing the lateral aponeurosis with catgut and the skin with silkworm-gut, and putting the leg up in extension in plaster. If there is primary union, and the resisting powers of the patient are good, the results obtained by this method are excellent.

The Passing of Bismuth Paste. WALLACE BLANCHARD, Chicago. *Medical Record*, May 18, 1912.

Having successfully treated 108 tuberculosis sinuses with Beck's paste, and 152 cases with a non-toxic substitute even more successfully, the author certainly speaks from experience. The main disadvantage of Beck's formula is that occasionally the bismuth is toxic, and deaths have been reported in an appreciable number of instances. Beck's theory that the bismuth serves as a sort of radium-emanating substance, and is therefore essential, the author regards as fanciful. Blanchard has therefore devised a substitute which is non-toxic and equally efficient. This formula is: white wax, 1 part; vaseline, 8 parts; mix while boiling. In badly infected cases sodium is added. For purposes of radiography the author offers a formula of 33⅓ per cent. iron subcarbonate in white vaseline. This throws a shadow equally as well as bismuth, and is non-toxic.

Blanchard also offers a few points in regard to the use of paste in tuberculous sinuses. It is useless to inject paste in a sinus containing a sequestrum. The latter must first be removed by surgical means. It is inadvisable to inject a newly opened sinus; wait until the wall is firm. Do not obstruct necessary drainage. Wait several months until the sinus track is well formed and the discharge is semi-transparent.

The Treatment of Rodent Ulcer. E. R. MORTON, London, *Lancet*, May 18, 1912.

Morton believes that carbon-dioxide snow is the remedy *par excellence* for rodent ulcers. His experience comprises 27 cases, all of which are cured; the earliest dates are two years ago. In no instance has there been a recurrence, and he has cured cases by this method which had recurred after treatment by *x*-ray, radium, etc. He believes that the carbon-dioxide snow attacks only the diseased cells and leaves the healthy cells intact.

Observations on the Thyroid Gland and Its Diseases. CHARLES H. MAYO, Rochester. *Surgery, Gynecology and Obstetrics*, April, 1912.

In this paper Mayo again calls attention to the superiority of surgical over medical treatment for the great majority of goiters, and particularly when hyperthyroidism is present. The mortality in his hands has been slight, while the majority are cured, and all patients are said to be benefited by an operation. When compensating hypertrophy develops in a remaining lobe and symptoms recur after the primary relief the operation yielded, Mayo advises the reduction of the circulation and removing more of the gland. However, this should not be necessary in more than six or eight per cent. of the cases. In a series of 160 cases operated upon at St. Mary's Hospital there was no fatality. Facts contributing to mortality are: Excessive dilatation of the heart, nephritis, diabetes, cerebral inco-ordination, insanity and operating at the height of the attack with marked gastric and intestinal symptoms.

Closure of Hernial Openings by Transplantation of Free Periosteal Flaps. (*Zur Sicherung grosser Brustforten mittels Transplantation freier Periostlappen*). D. G. ZESAS, *Zentralblatt für Chirurgie*, April 16, 1912.

Zesas reports excellent results obtained in the closure of large hernias by means of periosteal flaps derived from the patient's own tibia. The periosteum forms a thick, almost asseous covering which effectually closes the opening. Apparently the new periosteum does not form bone.

The Value of Arteriovenous Anastomosis in Gangrene of the Lower Limb. H. MORRISTON DAVIES, London. *Annals of Surgery*, June, 1912.

Davies tabulates the 36 recorded cases of femoral arterio-venous anastomosis for arterial gangrene. In seven of these the results were good. Davies' case, among these seven, reported in detail, afforded a brilliant cure.